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CHAPTER 2. OSTRACA WITH MARKS OF THE 18TH DYNASTY

2.1 INTRODUCTION

Now that we have outlined the structure of the organisation of the construction of the royal tomb during the 18th Dynasty to the best of our knowledge we have set the stage for the ostraca with marks from this time. Such ostraca are often easily recognised now that we are familiar with the repertory of identity marks from the 18th Dynasty found on ceramic vessel fragments and other objects datable to that period. Unfortunately these finds originate from inaccurately dated contexts. As a consequence they are helpful in the sense that they provide valuable information that aids us in distinguishing ostraca inscribed with mark from that period. Yet they are of little assistance in our attempts to pinpoint each ostrakon to the timeline of the 18th Dynasty. A more precise date is available for three groups of ostraca discovered in the Valley of the Kings, and they will serve as important anchor points in the chronological overview of 18th Dynasty ostraca with marks. A similar role will be played by a fourth set of ostraca for which a relative date will be proposed. In the second part of this chapter the meaning and purpose of the ostraca will be discussed, but as we do not possess any contemporary written texts to compare the ostraca to, this will turn out to be a most challenging undertaking.

Problematic for the corpus of 18th Dynasty ostraca as a whole is that it is relatively small when compared to the body of ostraca with marks from the 19th Dynasty and that of the 20th Dynasty. Moreover, we will experience difficulties in the identification of allomorphs of a specific mark as a result of the variability in the shape of the marks, which is considerably greater than in other periods. In order to surpass some of these obstacles we shall on several occasions rely on the semi-fixed sequences of marks that are preserved in their entirety on ostraca such as OL 6788 and ONL 6298. Such sequences reoccur on other, less well preserved or barely decipherable ostraca and support us in interpreting and dating such documents.

2.2 CHRONOLOGICAL OVERVIEW

Since we possess no written 18th Dynasty texts to compare the ostraca with marks to, we are mostly dependent on the archaeological context of ostraca to inform us of their date. A large percentage of ostraca with marks was discovered in the village of Deir el-Medina, and for some of them a provenance is recorded. However, we have seen in the previous chapter that these findspots are not adequately dated. Therefore we have to rely on the ostraca discovered in the Valley of the Kings, some of which offer a fairly precise indication of the period during which they were made. Ostraca from 18th Dynasty discovered in proximity of the tomb of an 18th Dynasty king thus seem to be datable to the reign of that ruler (FIG. 3).

Ostraca

O. ARTP 02/236

O. Brock 27

Provenance

between KV 47 and KV 37 or between KV 11 and KV 57¹

entrance of KV 17²

¹ Because the ostrakon was discovered in 2002, it must have come from either site 2 or site 4 of the excavations of the Amarna Royal Tomb Project, cf. Reeves (ed.), *Newsletter of the Valley of the Kings Foundation* 1, accessible through <http://www.nicholasreeves.com/item.aspx?category=Writing&id=102>.

² Information kindly provided by Rob Demarée, personal communication, 2015.

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O. BTdK 832 and 833	south east of KV 18, not <i>in situ</i> but discovered among pottery dated to the reign of Thutmose III ³
O. Cairo JE 72490 and 72494	between KV 30 and KV 26 ⁴
O. Cairo CG 25321	near KV 37 ⁵
O. Cairo JE 72498	end of branch leading to KV 34 ⁶
O. Cairo CG 24105 – 24108	entrance of KV 35 ⁷
O. Cairo JE 96650	branch leading to KV 35 ⁸
O. Cairo JE 72492	east of KV 47 ⁹
O. Cilli 278	area surrounding KV 47 ¹⁰
O. KV 10002, 10004, 10010 – 10012	from layers of debris in ‘site K’: west side of branch leading to KV 34 ¹¹
O. KV 63 Unnumbered	shaft of KV 63 ¹²
O. WV 1 – 6; 8 – 13	area between WV 22 and WV A ¹³

We can roughly divide these ostraca into five groups:

1. Ostraca O. Brock 27, O. BTdK 832 and O. BTdK 833. These ostraca do not come from a site that is particularly close to a royal tomb of the 18th Dynasty. The area of their findspot may have once been the site of an 18th Dynasty settlement of huts used by the workmen that constructed the tomb of Hatshepsut, but that is far from certain. The exact date of these ostraca is therefore obscure.
2. Ostraca O. Cairo CG 24105 – 24108 and O. Cairo JE 96650. These ostraca are associated with KV 35, the tomb of Amenhotep II, and we expect them to have been made during work on this sepulchre.
3. Ostraca O. WV 1 – 6; 8 – 13. This group of ostraca is evidently datable to the reign of Amenhotep III because they were found at the remote site of the workmen’s huts close to WV 22, the tomb of this king.

³ Andreas Dorn and Elina Paulin-Grothe, ‘Zwei Ostraka der 18. Dynastie aus dem Tal der Könige mit Namenszeichen (O. BTdK 832 und O. BTdK 833)’ *GM* 231 (2011), 17.

⁴ Reeves, *Valley of the Kings*, 328-330.

⁵ Daressy, *Ostraca*, 82.

⁶ According to the MA Thesis of Abdel Samie, accessible through <http://etheses.bham.ac.uk/737/1/abdelelsamie10MPhil.pdf>, this ostrakon bears number 329 attributed to it by its excavators, see Abdel Rahman Salah Hafez Abdel Samie, *Hieratic Ostraca of the Ramesside Period in the Egyptian Museum in Cairo: Documentation, Classification and Commentary* (Birmingham 2009), 94. After Reeves, *Valley of the Kings*, 329 it must therefore have been discovered at site 15 of the mission of Carter and Carnarvon in season 1920-1921.

⁷ Daressy, *Fouilles de la Vallée des Rois*, 64-65.

⁸ The ostrakon is inscribed with a note by its excavators: “Davis 1905-6. P.A.”, referring to site 16, the branch leading to the tomb of Amenhotep II, after Reeves, *Valley of the Kings*, 303.

⁹ The designation “419” on this ostrakon indicates that it was discovered by the Carter-Carnarvon mission on the east side of the hill containing the tomb of Siptah (KV 47), close to the entrance of the branch leading to the tomb of Thutmose III, see Reeves, *Valley of the Kings*, 330-331.

¹⁰ Debora Cilli, ‘Delivery Ostraca Discovered Adjacent to KV 47’ in: Mark Collier and Steven Snape (eds.), *Ramesside Studies in Honour of K.A. Kitchen* (Bolton 2011), 95.

¹¹ Zahi Hawass, ‘Excavation West of the Valley of the Kings near the Tomb of Thutmose III’ in: Tamás A. Bács, Zahi Hawass and Gábor Schreiber (eds.), *Proceedings of the colloquium on Theban archaeology at the Supreme Council of Antiquities, November 5, 2009* (Cairo 2011), 57-71.

¹² Information kindly provided by Ben Haring through contact with Lorelei Corcoran, personal communication.

¹³ Areas 1, 2, 4, 5 and 6; see Yoshimura (ed.), *Research in the Western Valley II*, 74-89, 173.

4. A number of ostraca were found in a branch of the Valley of the Kings that leads to KV 34, the tomb of Thutmose III. Tombs KV 40, KV 26, KV 30, KV 59, KV 31 and KV 33 are located in this part of the valley. About most of the tombs very little is known, but they are dated to the 18th Dynasty, some more specifically to the reign of Thutmose III.¹⁴ KV 32 was attributed to the queen of Amenhotep II, Tia-‘a,¹⁵ and KV 42 to the queen of Thutmose III, Hatshepsut-Meryt-Re, although it seems to have never been used by her. Instead, the mayor Sennefer and his wife, or the queen of Amenhotep II, Baketre are attested at the tomb.¹⁶ O. Cairo JE 72498 was found in the vicinity of this tomb, and can therefore be attributed to the reign of that king. O. CG 25321 is associated with KV 37 and O. Cairo JE 72490 and O. Cairo JE 72494 with the area between KV 30 and KV 26. Very little is known about these three tombs, but KV 37 has been dated to the reign of Thutmose III as well.¹⁷ O. KV 10002, 10004, 10010 – 10012 and O. ARTP 02/236 have been discovered in the same branch leading to the tomb of Thutmose III, but their exact findspot is unknown. The ostraca have come to light only recently, after the area had been ploughed through by decades of excavations, and are therefore not of a secure date.

5. Ostraca O. Cilli 278 and O. Cairo JE 72492 have been discovered near the entrance to the branch in the valley mentioned above. It is possible that they date to the same period, but because they were discovered in disturbed layers, we cannot rely on their provenance.

Groups 2, 3 and 4 of ostraca from the Valley of the Kings with a secured provenance serve perfectly as chronological anchor points, because they date to the reign of Amenhotep II, Amenhotep III and Thutmose III respectively. In the remainder of this chapter, we will refer to the ostraca associated with the reign of Thutmose III as group A. The ostraca found near the tomb of Amenhotep II will constitute group B, and those from the West Valley will be referred to as group C.

¹⁴ René Preys, ‘Les tombes non-royales de la Vallée des Rois’ *SAK* 40 (2011), 322-324.

¹⁵ See most recently Hanna Jenni, ‘La Vallée des Rois, ses Tombeaux et ses Ouvriers. Travaux concernant les tombes KV 17, 18, 32 et 47 menés par l’Institut d’Égyptologie de l’Université de Bâle’ *EAO* 54 (2009), 17; http://www.thebanmappingproject.com/sites/browse_tomb_846.html accessed on 29-4-2015.

¹⁶ Catherine H. Roehrig, ‘The Building Activities of Thutmose III in the Valley of the Kings’ in: Eric H. Cline and David O’Connor (eds.), *Thutmose III. A New Bibliography* (Ann Arbor 2005), 248-250; Marianne Eaton-Krauss, ‘Who commissioned KV 42 and for whom?’ *GM* 234 (2012), 53-60; but compare Preys, ‘Les tombes non-royales’, 333-338.

¹⁷ See http://www.thebanmappingproject.com/sites/browse_tomb_851.html accessed on 29-4-2015.



FIGURE 3. TOMBS IN THE VALLEY OF KINGS IN THE AREAS IN WHICH 18TH OSTRACA WITH MARKS WERE FOUND.

2.2.1 Group A: ostraca from the reign of Thutmosis III

The four ostraca in this core group are O. Cairo JE 72490, O. Cairo JE 72494, O. Cairo JE 72498, and O. Cairo CG 25321. In terms of the particular order in which the marks are inscribed, these ostraca have very little in common. The most important document in this group is O. Cairo JE 72490. It features 22 marks but only 20 different ones because marks □ and ○ are included twice. The marks are written in two lines, but they seem to converge at the right end of the ostrakon: the right end of the upper row slants downwards, while the right end of the lower line slants upwards. It would thus appear that the upper line was written from left to right. At the right end, the author of the ostrakon inscribed mark √ below mark ∅, and then continued in the upper line from right to left. This *boustrophedonic* way of inscribing signs is very different from hieroglyphic and hieratic scribal practise, but it will be shown that other 18th Dynasty ostraca were inscribed in the same way.

In the lower line of O. Cairo JE 72490 we recognise ⌘, the identity mark of the Overseer of the Work, Kha. It is unknown if he held this position already at the moment this ostrakon was inscribed. If he did, then there is a possibility that the sequence of marks on O. Cairo JE 72490 should be right from the left end of the lower line to the right, to continue in the upper line from right to left. Such a reading would place Kha's mark closer to the beginning of the sequence, in a position where one would expect the mark of a foreman or a

deputy.¹⁸ This is no more than a suggestion, as we cannot determine in what capacity Kha was recorded on this ostracon exactly. We therefore keep to the following reading of the ostracon:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

TABLE 5. SEQUENCE OF MARKS ON O. CAIRO JE 72490

O. Cairo JE 72494 shares three marks with O. Cairo JE 72490 (see TABLE 6): , and . A fourth sign is damaged and unidentifiable. The ostracon seems to be closely related to O. Cairo JE 72490, as the shape of the mark is very similar in both ostraca. The two documents may have been made by the same hand. O. Cairo JE 72498 is incompletely preserved and displays nine marks, two of which are fragmentary and can not be securely identified. O. Cairo JE 72498 shares four marks with O. Cairo JE 72490 and one with O. Cairo JE 72494. The fourth document in this group is O. Cairo CG 25321, also incompletely preserved. It displays at least 12 marks, of which two are unidentifiable. The ostracon shares eight marks with O. Cairo JE 72490 and three marks with O. Cairo JE 72498. Together the ostraca in group A contain at least 24 different marks:

¹⁸ As will become clear in later chapters, the foremen and their deputies that directed the workforce were often mentioned at the beginning of lists of workmen, whether written in hieratic or composed with marks. See also ONL 6298, below, p. 100-101; and below, 2.6.5.

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JE 72490	JE 72494	JE 72498	CG 25321

TABLE 6. MARKS ATTESTED ON THE OSTRACA OF GROUP A

2.2.2 Group B: ostraca from the reign of Amenhotep II

The ostraca in this group are O. Cairo CG 24105, O. Cairo CG 24106, O. Cairo CG 24107, O. Cairo CG 24108, and O. Cairo JE 96650. The provenance, palaeography and style of O. Cairo CG 24105 – 24108 suggests they were written by the same scribe. Two key ostraca in this group are O. Cairo CG 24105 and O. Cairo CG 24107, because they display almost the same sequence of marks. Let us begin with the former piece. It is slightly damaged and we seem to be missing two marks, but the remainder of the ostrakon is perfectly legible. Like O. Cairo JE 72490, this ostrakon is written in *boustrophedon*:¹⁹ the first mark that was jotted down is , at the right end of the upper line. From that point onwards the scribe seems to have followed the contour of the ostrakon. At the rounded left end of the limestone chip the line of marks curves around, with the result that the lower line of marks was inscribed from left to right.

The rightmost mark in the upper line of O. Cairo CG 24107 is . Left of it we observe mark . The same mark features on O. Cairo CG 24105 left of , but here it

¹⁹ The term *boustrophedon*, literally ‘as the ox turns’, is used for inscriptions in which the writing is reversed in every other line. In many examples of *boustrophedonic* inscriptions the individual characters are reversed as well. That is not the case with ostraca with marks written in *boustrophedon*.

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As mentioned, the palaeography of the marks on O. Cairo CG 24106 and O. Cairo CG 24108 appears, at least at a first glimpse, to be very similar to that of O. Cairo CG 24105 and O. Cairo CG 24107. Nevertheless, the former two ostraca have not been written in a sequence that conforms in any way to that of the latter two. On O. Cairo CG 24108 we reencounter marks \bigcirc and \ominus , known from group A. Not yet attested are 𐀀 and an allomorph of 𐀁 turned upside down. The other marks are all attested on O. Cairo CG 24105 and O. Cairo CG 24107. It would appear that the flower-shaped mark 𐀂 is an allomorph of 𐀃 and 𐀄 , and we will come across supporting evidence for this equivalency on O. Varille 423 discussed below.²⁰

It is because of the similarity to O. Cairo CG 24105 and O. Cairo CG 24107 that we can identify marks 𐀅 , 𐀆 , 𐀇 , 𐀈 , and 𐀉 on O. Cairo CG 24106 as allomorphs of 𐀊 , 𐀋 , 𐀌 , 𐀍 and 𐀎 . Mark 𐀏 is probably an allomorph of 𐀐 , despite the fact that this mark is already present elsewhere on O. Cairo CG 24106. O. Cairo JE 72490 already clearly demonstrated that a particular mark can be repeated within the same ostracon. This appears to have happened to mark 𐀑 on O. Cairo CG 24106 as well. Marks 𐀒 and 𐀓 are not found on the other ostraca of group B, and as we will see, they appear to be uniquely attested on this document.

The final ostracon of group B displays no more than nine marks, which are arranged in an order that is not related to the sequence of O. Cairo CG 24105 and O. Cairo CG 24107. Eight of the marks are also attested in the previous four ostraca, but new is mark 𐀔 .

Together the ostraca in group B contain at least 37 different marks (TABLE 8). Of this total, 15 are also found in group A (TABLE 11), but it will be demonstrated that there are indications that mark 𐀕 (found in group B) is an allomorph of mark 𐀖 (found in group A) in at least one instance. Whether this equivalency is universally valid for the ostraca from the 18th Dynasty is unclear.²¹

²⁰ See below, p. 90-91.

²¹ See ONL 6302 below, p. 93-94.

2.2.3 Group C: ostraca from the reign of Amenhotep III

The documents that constitute this group are the 12 ostraca, O. WV 1 – 6 and O. WV 8 – 13,²² found in the area between KV 22 and KV A. The ostraca are clearly related to the each other because with a few exceptions, the individual marks are attested on several ostraca each (TABLE 9). Most important for our current aims is O. WV 3. Although it is badly damaged, it is clear that it is inscribed with a sequence of marks that reoccurs on several other ostraca from the 18th Dynasty.²³ On account of O. WV 3 this sequence can be pinpointed in the reign of Amenhotep III. We shall see below that the sequence of O. WV 3 is to some extent recognisable in O. WV 1, O. WV 4 and O. WV 10.²⁴

One of the most evident parallels for the sequence of O. WV 3 is OL 6788. The similarity between the sequences of marks in both documents is so great that the latter ostrakon can securely be attributed to the group C ostraca. While we will discuss OL 6788 in more detail below (2.2.9), a quick peek at this ostrakon is required at this point. Among the marks in the upper line of the document feature two different marks, a flower-shaped mark \mathfrak{A} (in the remainder of this chapter represented by font type Ψ) and mark \mathfrak{A} . It was pointed out above that in group B marks \mathfrak{B} , \mathfrak{A} and Ψ were all allomorphs of one and the same mark. At the time of the group C ostraca this equivalency was no longer valid, and OL 6788 demonstrates that at this point \mathfrak{A} is to be distinguished from Ψ . As a result, undated ostraca that display mark \mathfrak{A} are difficult to interpret because we are not in every case certain whether it represents an allomorph of Ψ or not. Mark \mathfrak{A} is not attested on any of the ostraca from the area of the tomb of Amenhotep III, but we can be fairly certain that it must have already been in use around the time these 12 ostraca were created. For one, that is suggested by the fact that O. WV 3 records almost the same sequence of marks as OL 6788 and other ostraca that all include mark \mathfrak{A} . It is therefore expected that it originally featured on O. WV 3 too. Secondly, mark \mathfrak{A} is incised on a ceramic vessel fragment from the same area of the Amenhotep III ostraca.²⁵

Mark \mathfrak{A} on O. WV 13 is most probably an allomorph of mark \mathfrak{A} on O. WV 11. The latter mark is the more frequent form, and it occurs in the sequence of OL 6788. On the latter ostrakon mark \mathfrak{A} is recorded adjacent to mark \mathfrak{B} , as is on O. WV 13. Additionally, it will be demonstrated that mark \mathfrak{A} is recorded on O. Stockholm MM 14130 in the same position as in the sequence of OL 6788.²⁶

Mark \mathfrak{A} is not attested in group B, but in group A we have discerned mark \mathfrak{A} , which somewhat resembles \mathfrak{A} . It is unclear if the two marks can be interpreted as allomorphs of the same mark because there is no convincing evidence in support of, or in objection to an equivalency. The possibility that it concerns a single mark will be considered in the remainder of this chapter.

As an assemblage, the ostraca in group C contain at least 49 different marks. Of these marks, 23 or perhaps 24 are also found in group B, and 16 or perhaps 17 in group A (TABLE 11). Remarkably, these 17 marks are not all the same as the 15 marks that are found both in group B and A. Looking solely at the ostraca in groups A, B and C, it would thus appear that some marks were in use in group A, disappeared in group B and reappeared in group C. On the basis of ostraca that are not securely dated it will be argued below that this is not true for all of these marks, and several of such marks will be attributed to group B. One of the newly attested marks in group C is \mathfrak{A} , which is not found in groups A and B. One wonders if the

²² O. WV 7 has also been described as an ostrakon with workmen's marks, see Yoshimura (ed.), *Research in the Western Valley II*, 81, but too few traces have survived on it to include it in this study.

²³ Particularly important parallels are OL 6788, O. Stockholm MM 14130, and ONL 6298, see below p. 97-101.

²⁴ See below, 2.2.9.

²⁵ Yoshimura (ed.), *Research in the Western Valley II*, 96, fig. 56, WV 447.

²⁶ See also below, p. 124, ONL 6416.

otherwise unique mark Δ on O. Cairo CG 24106 is perhaps an allomorph of Ψ , because it is of a similar shape, but there is unfortunately no supporting evidence.

O. WV 1	O. WV 2	O. WV 3	O. WV 4	O. WV 5	O. WV 6	O. WV 8	O. WV 9	O. WV 10	O. WV 11	O. WV 12	O. WV 13
×				×		×		×			

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				𐀓				𐀓			
				𐀓				𐀓	𐀓		
				𐀓				𐀓	𐀓	𐀓	
							𐀓				
								𐀓		𐀓	
									𐀓		
									𐀓		
									𐀓		
										𐀓	

TABLE 9. MARKS ATTESTED ON THE OSTRACA OF GROUP C

2.2.4 A fourth group: group D

As explained above, the three core groups A, B and C are established first and foremost on account of their provenance. A fourth group of 18th Dynasty ostraca, henceforth called group D, can be established on the basis of other criteria. The exact findspot of the ostraca of this group is unknown and therefore *prima facie* no specific date can be proposed for them. The ostraca in question are O. Cairo JE 96585, O. Cairo JE 96587, O. Cairo JE 96606, O. Cairo JE 96330.B and .C, and O. Cairo JE 96331. Despite their unclear provenance all five ostraca were reportedly discovered together in the Valley of the Kings by the mission of Davis and Ayrton in the season of 1905 – 1906.²⁷ They have a number of aspects in common. The first feature is the great dimensions of the marks on these ostraca. Many of the marks on these ostraca are about 5 by 5 cm in size. This is well illustrated by counting the number of marks that fit next to each other on the ostrakon:

<i>Ostrakon</i>	<i>Width</i>	<i>Number of marks in a row</i>
O. Cairo JE 96585	19.0 cm	4 marks
O. Cairo JE 96587	22.5 cm	4 marks
O. Cairo JE 96606.B	11.5 cm	3 marks
O. Cairo JE 96630	34.5 cm	5 marks
O. Cairo JE 96631	29.5 cm	7 marks

These are considerably smaller numbers than the ostraca in groups A, B and C. Compare for example the following ostraca:

<i>Ostrakon</i>	<i>Width</i>	<i>Number of marks in a row</i>
O. Cairo JE 72490	19.0 cm	13 marks
O. Cairo CG 24107	22.0 cm	13 marks
OL 6788	25.0 cm	12 marks

The marks on the ostraca in group D are clearly much larger. Related to the size of the marks is the instrument that was used to draw them. In each case this was a brush that is much

²⁷ The provenance of these five ostraca, as well as that of O. Cairo JE 96590 and O. Cairo JE 96603 – most probably related documents, see below, p. 119-120 – is indicated by the acronym “B.M.”. Because this site designation is otherwise not known, one wonders if it was perhaps misread for “P.M.”, the designation given to one of the areas excavated by Davis and Ayrton in the season of 1905-1906. The location of this site is the branch leading to the tomb of Amenhotep II and the area of KV 53 in particular, see Reeves, *Valley of the Kings*, 297 and 303.

thicker than the pen used for the ostraca in groups A, B and C. Furthermore, in all ostraca in group D red ink was used to draw marks.²⁸

Another aspect of the ostraca in group D is that none of them is composed in neat lines. The layout of the ostraca seems to be dictated by the shape of the ostrakon itself rather than by the scribe's desire to arrange marks in columns or lines. Take for example O. Cairo JE 96606.B. The left half of the ostrakon is higher than the right half, and therefore several marks are arranged vertically on the left end, and only one mark is written on the right end.

Also characteristic for the marks in group D is their style: all marks seem to have been drawn with quick, steady lines which are never shaky or hesitant. It is difficult to compare the hand of the marks, as they are mostly simple geometric shapes that do not clearly demonstrate the traits of the hand of a particular scribe. Perhaps the only mark that can be compared is mark , which appears in O. Cairo JE 96606.B, O. Cairo JE 96587 and O. Cairo JE 96631. Particularly in O. Cairo JE 96606.B and O. Cairo JE 96631 this mark is very similar, and could well have been made by the same hand: the beak of the bird is very short, the body of the bird is slim and slants to the left, and the legs are long.

All these features strongly suggest that the five ostraca form a single group. That is supported by the repertory of marks inscribed on the ostraca (TABLE 10). The majority of the marks in this group can be identified without any problems because they occur on the ostraca from groups A, B and C. O. Cairo JE 96585 seems to be complete. It displays a total of nine marks, of which  appears here for the first time. It closely resembles mark , but O. Cairo JE 96591²⁹ is inscribed with both  and , demonstrating that the two need to be differentiated. Mark  is probably an allomorph of  turned upside down.

O. Cairo JE 96587 is completely preserved too and displays 10 marks, all of which are complete. In the left upper corner we distinguish mark , which we had not yet encountered before. O. Cairo JE 96606 is the accession number that belongs to three fragments: .A, .B and .C. Fragment .A shows unclear lines which cannot be identified as workmen's marks, and the significance of which is unclear; fragment .B displays a total of five marks, all encountered elsewhere and therefore securely identified. Fragment .C displays three incompletely preserved marks. The top mark is not securely identified, but the most likely option is an allomorph of mark : , but rotated 180 degrees. The mark left of it is damaged, but can be identified when we turn to O. Cairo JE 96630. This ostrakon appears to be complete and displays 10 marks. At the bottom we can discern mark , not attested in groups A, B and C, which is probably the same mark as the damaged mark on O. Cairo JE 96606.C. The last ostrakon, O. Cairo JE 96631, also preserved in its entirety, displays 21 different marks. Mark  at the lower half of the ostrakon would appear to be an allomorph of . A damaged mark  that somewhat resembles it is situated at the top of the ostrakon. The traverse stroke through the middle of the horizontal element suggests that it is to be distinguished from all allomorphs of , which lack such a vertical stroke. The mark perhaps represents Gardiner Y1, , but it is not attested as such elsewhere in the 18th Dynasty.

As mentioned, the marks on the ostraca in group D do not seem to have been arranged in a clear order. The ostraca are therefore not related to each other by a common sequence of marks, apart perhaps from the following short sequences of marks:

- O. Cairo JE 96587:  –  – 
O. Cairo JE 96631:  –  –  – 
O. Cairo JE 96630:  –  – 

²⁸ As an exception to the previous two statements, four marks on O. Cairo JE 96587 were not drawn with a thick brush since they consist of very thin lines. They were inscribed in a darker shade of red. The other six marks on the ostrakon do conform to the criteria of brush size and red paint.

²⁹ This ostrakon is attributed to group D below, see p. 121.

mark  is found in groups A and C;³⁰
 marks , , , ,  and  are found in groups B and C;
 mark  is found only in group B;
 marks , , , ,  and  are attested in group C exclusively.

The five marks , , ,  and  are not attested in any of the core groups. This observation supports the treatment of the five ostraca under discussion here as a separate group. In absolute numbers the marks in group D are closest related to group C, but in percentages the marks are strongest associated with group B:

Relation to group A: 10 common marks = 41.7% of all marks in that group
 Relation to group B: 17 common marks, = 46.0% of all marks in that group
 Relation to group C: 22 common marks, = 44.9% of all marks in that group

Although the group D ostraca are clearly related to group C, they include two marks,  and , which do no longer seem to occur in group C, but do feature on ostraca from groups A and B. Hence, group D is best situated between groups B and C.

Before we move on to the following section, we are required to return to mark . In our discussion of ostraca from group C it was pointed out that the interpretation of mark  can be problematic. This mark occurs in group D as well, and it will be assumed that it represents an allomorph of mark , as in group B. There is no way of determining if this assumption is correct, but since the flower-shaped mark  was in use in group B and in group C, one would expect it to appear in the intermediate group D as well. This would mean that during the reign of Amenhotep III (group C) mark  began to be used as a mark on its own, to be differentiated from mark  that was still functional.

A	B	C	D
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			

³⁰ The mark is also attested on O. KV 10004, an ostrakon that will be attributed to group B below, see p. 91-92.

			𓄏
			𓄏
			𓄏

TABLE 11. MARKS ATTESTED ON THE OSTRACA OF GROUPS A – D

2.2.5 Proposing a relative date for undated ostraca from the 18th Dynasty

Although the majority of 18th Dynasty ostraca is of an uncertain date, the four core groups A – D constitute useful points of reference. By comparing the marks on an undated ostrakon to the marks within groups A, B, C and D each, one is able to determine the degree of its association to each of these groups in terms of shared marks. In order to obtain an accurate view of the degree of association between an undated ostrakon and each of the four core groups, it is necessary to take into account not only those marks that are attested in the core groups, but also those that are not.

Simply counting the absolute number of attested or unattested marks does however not lead to an accurate assessment of the relation between an undated ostrakon and the four core groups. To arrive at a figure that expresses the degree of association for an undated ostrakon, the percentage of marks that are attested in each core group is calculated, as is the percentage of marks that are unattested in a core group. The difference of these two percentages represents the degree of association. When this degree is calculated for each of the four core groups, the group with the highest degree of association should be an indication of the date of the ostrakon.

The general assumption behind this dating method is that the greater the number of shared marks is between two ostraca, the closer they must date together. In our endeavours to attribute undated 18th Dynasty ostraca to a particular period, it should be a constant reminder that this assumption is not necessarily true. To illustrate this point, we may envisage two hypothetical scenarios. In the first one, a scribe decides at a certain moment to record particular events in which 20 workmen were involved. During these events the workmen were divided into two groups, and the scribe therefore created two different ostraca to document each group separately. The ostraca were thus created at the very same moment, but display a completely different set of marks. This cautions us that two ostraca with little overlap need not date far apart. A second imaginary scenario warns us that the opposite situation is not *per se* indicative of contemporaneity. A group of workmen may have employed a set of identity marks during the reign of Thutmosis III. The generation after them could have employed a completely different set of marks. Another generation later, the grandsons of the workmen active under Thutmosis III may have found the inspiration for their own identity marks in those of their grandfathers. As a result, a set of marks on an ostrakon from the reign of Thutmosis III could be very similar to a much later document.

Our dating method is of course more reliable: we will not compare the marks on one ostrakon to the marks on another, but the marks of one ostrakon to the marks attested within a *group* of ostraca that are well dated. Nevertheless, there is no way of determining to what extent the ostraca in each core group are representative of the complete set of marks that were in use during the period to which they date. The validity of the use of these core groups may therefore be questioned. Take for example ONL 6489. This ostrakon is attributed below to group A.³¹ Among the marks on this ostrakon features 𓄏. In the ostraca that constitute our core groups this mark is only attested in group C, but not in A, B or D. This observation may throw into doubt the reliability of using the ostraca as core groups: how can it be that ONL 6489 dates to group A if mark 𓄏 occurs in our core groups only in group C? Unfortunately it is impossible to qualify how accurate the dating method actually is. It could be through chance that mark 𓄏 is not attested in any of the key ostraca in groups A, B and D, which

³¹ See below, p. 88.

might lead to a bias in the method of dating: undated ostraca with mark $\overline{\text{A}}$ might be unjustly associated with group C. On the other hand, the method appears to be robust enough to overcome its partial bias. After all, the calculation of the degrees of association does relate ONL 6489 to group A instead of group C. In addition, there is of course the possibility that a mark was employed for a while at the time of the group A ostraca, but occurred only infrequently during that period and may have been abandoned all together during the period of groups B and D. It would then have been reinstated in the period of group C. In this scenario, the ostraca that constitute the core groups would indeed be quite a realistic representation of the development of the repertory of marks during the 18th Dynasty.

Nevertheless, the calculation of degrees of association may only serve as a guideline. Occasionally it will be of great importance, but the attribution of an undated ostrakon to a specific period will be based on other significant factors as well. In some instances, particularly in the case of fragmentary ostraca, the absolute number of marks that occurs in one of the core groups is more revealing than is the calculated degree of association. Much weight will furthermore be given to marks that are ordered in a specific sequence that also occurs on better dated ostraca. Some relevance will be assigned to the style of the marks and occasionally to the provenance of the ostrakon. Collectively, these aspects should provide us with an indication of the date of 18th Dynasty ostraca.

2.2.6 Ostraca attributable to group A

There are six ostraca that can be attributed to group A, and they should therefore date to the reign of Thutmose III. Such an attribution may be considered for four more ostraca but is less certain.

O. KV 10011

This incomplete ostrakon displays only four marks. Marks f , $\overline{\text{A}}$ and Y are found in groups A, B and C, but \oplus is only found in group A. Therefore this ostrakon most likely belongs to group A as well.

Relation to group A:	4 common marks, 16.7%; 0 unattested marks, 0% degree of association is 16.7% – 0% = 16.7%
Relation to group B:	3 common marks, 8.1%; 1 unattested mark, 2.7% degree of association is 8.1% – 2.7% = 5.4%
Relation to group C:	3 common marks, 6.1%; 1 unattested mark, 2.0% degree of association is 6.1% – 2.0% = 4.1%
Relation to group D:	2 common marks, 6.9%; 2 unattested marks, 6.9% degree of association is 6.9% – 6.9% = 0%

The calculated degrees of association show that O. KV 10011 is closest related to group A.

O. KV 10002

This ostrakon is completely preserved but one mark is damaged and unrecognisable: $\overline{\text{A}}$. The other 15 marks are clear. The sequence of marks is not known from other documents. Marks A , O , X , Y , $\overline{\text{A}}$ and H are found in all four core groups; mark T is found in groups A, B and C; f in group A, B and D; $\overline{\text{A}}$ and f in both A and C; f in C (and in A if f is an allomorph of f); T in B, C and D; \oplus only in A; $\overline{\text{A}}$ only in B; and $\overline{\text{A}}$ in C and D. There is a strong relation to the marks in group A:

Relation to group A:	11 or 12 common marks, 45.8% or 50.0%; 4 or 3 unattested marks, 16.7% or 12.5% degree of association is 45.8% – 16.7% = 29.1% or 50.0% – 12.5% = 37.5%
Relation to group B:	10 common marks, 27.0%; 5 unattested marks, 13.5% degree of association is 27.0% – 13.5% = 13.5%
Relation to group C:	12 common marks, 24.5%; 3 unattested marks, 6.1% degree of association is 24.5% – 6.1% = 18.4%
Relation to group D:	9 common marks, 31.0%; 6 unattested marks, 20.7% degree of association is 31.0% – 20.7% = 10.3%

With an association degree of 29.1% or 37.5%, O. KV 10002 appears to be closest related to group A.

ONL 6371

The top of ONL 6371 features a triangular shape that is probably not a workman's mark.³² In the right lower corner of the ostrakon a mark is inscribed that looks like \llcorner . It would seem to be a double variant of mark \lrcorner , but it is as such nowhere else attested. Perhaps \llcorner is an attempt to write \lrcorner in a double outline as on O. Cairo JE 72490. Alternatively, it may indeed constitute two instances of mark \lrcorner . In contrast to the all other marks on ONL 6371, \llcorner is written in black ink, seemingly in finer lines of ink. It may have been added at a later point. Mark \boxminus could be an allomorph of mark \square , attested on O. Cairo JE 72490. Indeed, if we comprehend the reading direction of the sequence of marks on the latter ostrakon correctly, some of the marks on ONL 6371 are inscribed according to their relative position in the arrangement of O. Cairo JE 72490: marks \ulcorner , \boxminus , \smile , Δ , \dagger and \lrcorner are situated in slots 9, 12, 14, 15, 17 and 19. Calculating the degree of association for all groups supports the observation that ONL 6371 is related to O. Cairo JE 72490: the ostrakon is evidently related to the ostraca in group A. ONL 6371 is therefore attributed to the reign of Thutmosis III.

Relation to group A:	9 common marks, 37.5%; 2 unattested marks, 8.3% degree of association is 37.5% – 8.3% = 29.2%
Relation to group B:	7 common marks, 18.9%; 4 unattested marks, 10.8% degree of association is 18.9% – 10.8% = 8.1%
Relation to group C:	7 common marks, 14.3%; 4 unattested marks, 8.2% degree of association is 14.3% – 8.2% = 6.1%
Relation to group D:	4 common marks, 13.8%; 7 unattested marks, 24.1% degree of association is 13.8% – 24.1% = -10.3%

ONL 6443

Five marks are preserved on ONL 6443 and traces of a possible sixth mark are visible at the left edge of the ostrakon. As on ONL 6371 mark \boxminus is probably an allomorph of mark \square attested on O. Cairo JE 72490. Because the marks do not appear to have been inscribed in a particular order that is known from other ostraca we have to rely on the marks themselves for a date of ONL 6443. An attribution to group A seems most plausible because (the allomorph of) mark \square is only attested in this group. Additionally the degree of association with this group is higher than with others.

³² See below, p. 144; p. 159.

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Relation to group A:	4 common marks, 16.7%; 1 unattested mark, 4.2% degree of association is 16.7% – 4.2% = 12.5%
Relation to group B:	4 common marks, 10.8%; 1 unattested mark, 2.7% degree of association is 10.8% – 2.7% = 8.1%
Relation to group C:	2 common marks, 4.1%; 3 unattested marks, 6.1% degree of association is 4.1 – 6.1 = -2.0%
Relation to group D:	2 common marks, 6.9%; 3 unattested marks, 10.4% degree of association is 6.9% – 10.4% = -3.5

ONL 6489

The obverse of ONL 6489 is inscribed with a row of at least nine marks that feature in a sequence that is not attested elsewhere. The signs on the reverse are unclear. The repertory of marks as well as the particular shape of mark \perp is similar to ostraca O. Cairo JE 72498 and O. Cairo CG 24108, situated in groups A and B.³³ The degree of association with group A is very high and suggests ONL 6489 dates to the reign of Thutmose III.

Relation to group A:	7 common marks, 29.2%; 2 unattested marks, 8.3% degree of association is 29.2% – 8.3% = 20.9%
Relation to group B:	6 common marks, 16.2%; 3 unattested marks, 5.4% degree of association is 16.2% – 5.4% = 10.8%
Relation to group C:	7 common marks, 14.3%; 2 unattested marks, 4.1% degree of association is 14.3 – 4.1% = 10.2%
Relation to group D:	3 common marks, 10.4%; 6 unattested marks, 20.7% degree of association is 10.4% – 20.7% = -10.3%

ONL 6454

This fragment of an ostrakon displays not more than three marks: Σ , \oplus and \ominus . As will become clear later, these marks are attested in the Ramesside period as well. The date of ONL 6454 is therefore uncertain. The layout of the ostrakon with marks written in a row is, however, suggestive of a date in the 18th Dynasty. The three marks are attested together on O. Cairo CG 25321, where they appear, coincidentally perhaps, in the same relative positions. O. Cairo CG 25321 is one of the ostraca that constitute group A, and ONL 6454 is best attributed to the period of these ostraca. That is also suggested by the degree of association with group A, which is higher for this group than for any other.

Relation to group A:	3 common marks, 12.5%; 0 unattested marks, 0% degree of association is 12.5% – 0% = 12.5%
Relation to group B:	2 common marks, 5.4%; 1 unattested mark, 2.7% degree of association is 5.4% – 2.7% = 2.7%
Relation to group C:	2 common marks, 4.1%; 1 unattested mark, 2.0% degree of association is 4.1% – 2.0% = 2.1%
Relation to group D:	1 common mark, 3.5%; 2 unattested marks, 6.9% degree of association is 3.5% – 6.9% = -3.4%

³³ Compare also O. UC 45683, which is of an uncertain date, see below, p. 133-134.

ONL 6461

The damaged mark in the upper row situated on the right edge is probably O. Traces of another mark are visible underneath it, but it is impossible to identify. The order of marks on ONL 6461 is not attested on other ostraca, and it is difficult to date. Mark λ is only securely attested in group A, while on the other side of the spectrum mark $\Gamma\Gamma$ is only attested in group C. One could propose a later date for ONL 6461 because λ is also attested on O. Cairo JE 72450, attributed to group D.³⁴ On the other hand, the degree of association with group A is relatively high. We may speculate that $\Gamma\Gamma$, on ONL 6461 rendered as \mathbb{I} , is a hieratic variant of Π , attested in group A. Support for this assumption is provided by the sequence of ONL 6465.³⁵ With much hesitation ONL 6461 is attributed to this group.

Relation to group A:	4 common marks, 16.7%; 2 unattested marks, 8.3% degree of association is 16.7% – 8.3% = 8.4%
Relation to group B:	3 common marks, 8.1%; 3 common marks, 8.1% degree of association is 8.1% – 8.1% = 0%
Relation to group C:	4 common marks, 8.2%; 2 unattested marks, 4.1% degree of association is 8.2% – 4.1% = 4.1%
Relation to group D:	2 common marks, 6.9%; 4 unattested marks, 13.8% degree of association is 6.9% – 13.8% = -6.9%

ONL 6424

Apart from a pre-fired potter's mark, this ceramic ostrakon displays four marks. The sequence is not attested elsewhere. Mark \ast is not found on any of the ostraca in the four key groups. Mark λ is attested in group A, but it occurs also on ONL 6298, which is attributed to group C. The small number of marks on ONL 6424 forms an obstacle in the process of dating the ostrakon. All three marks occur in group A, and on O. Cairo JE 72490 in particular. We may propose that mark \ast is an allomorph of \star , also found on the latter ostrakon, but this mark does not provide a better indication of the date of ONL 6424. The document is hesitantly attributed to group A. ONL 6424 would then probably date around the period of Thutmose III. A much later date in the reign of Amenhotep III is also possible, but statistically less probable.

Relation to group A:	3 common marks, 12.5%; 0 unattested marks, 0% degree of association is 12.5% – 0% = 12.5%
Relation to group B:	2 common marks, 5.4%; 1 unattested mark, 2.7% degree of association is 5.4% – 2.7% = 2.7%
Relation to group C:	2 common marks, 4.1%; 1 unattested mark, 2.0% degree of association is 4.1% – 2.0% = 2.1%
Relation to group D:	1 common mark, 3.5%; 2 unattested marks, 6.9% degree of association is 3.5% – 6.9% = -3.4%

ONL 6402

The interpretation of this ostrakon is very unclear because it displays marks that are not attested elsewhere, or perhaps rather allomorphs of marks that are difficult to identify. The marks are very tentatively interpreted as $\Upsilon - \omega - \ast - \mathbb{H} - \Gamma - \Upsilon - \mathfrak{C}$, a sequence that is not

³⁴ See below, p. 121-122.

³⁵ See below, p. 106.

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encountered on other documents. The identification of mark $\overline{\text{𐀓}}$ is particularly uncertain because it is not completely preserved. Mark $\overline{\text{𐀔}}$ is not attested in the four core groups, the other marks are. Mark $\overline{\text{𐀔}}$ does feature on ONL 6424, which is very tentatively attributed to group A. Proposing a date is similarly difficult for ONL 6402. Six of its marks are found in group C, but if mark $\overline{\text{𐀓}}$ is an allomorph of $\overline{\text{𐀓}}$ the same marks are attested in group A as well. A calculation of the degrees of association suggests that ONL 6402 is closer related to group A than to group C. In analogy with ONL 6424, ONL 6402 is thus attributed to group A, albeit with much reservations.

Relation to group A:	6 common marks, 25.0%; 0 unattested marks, 0% degree of association is 25.0% – 0% = 25.0%
Relation to group B:	4 common marks, 10.8%; 2 unattested marks, 5.4% degree of association is 10.8% – 5.4% = 5.4%
Relation to group C:	6 common marks, 12.3%; 0 unattested marks, 0% degree of association is 12.3% – 0% = 12.3%
Relation to group D:	4 common marks, 13.8%; 2 unattested marks, 6.9% degree of association is 13.8 – 6.9% = 6.9%

O. ARTP 02/236

As mentioned above, this ostracon was probably discovered in the branch of the Valley of the Kings leading towards the tomb of Thutmosis III. The majority of the ostraca with marks from this area are attributable to the reign of this king (group A), and so *O. ARTP 02/236* could well be dated to the same time. That is not unproblematic because the ostracon displays no more than four marks in an order that does not adhere to a sequence known from other ostraca. Mark $\overline{\text{𐀓}}$, probably for $\overline{\text{𐀓}}$, as well as $\overline{\text{𐀔}}$ and $\overline{\text{𐀕}}$ are found in group A, but $\overline{\text{𐀖}}$ is only attested in group C. Yet, ostraca ONL 6465 and ONL 6461 demonstrate that $\overline{\text{𐀖}}$, an allomorph of $\overline{\text{𐀖}}$, may have been used as an allomorph of $\overline{\text{𐀖}}$. The latter mark is attested on *O. Cairo JE 72490*, one of the key ostraca of group A. If we are correct in equating $\overline{\text{𐀖}}$ with $\overline{\text{𐀖}}$ all four marks of *O. ARTP 02/236* are attested in group A, which would drastically increase the degree of association with group A. The ostracon is therefore tentatively attributed to group A.

Relation to group A:	4 common marks, 16.7%; 0 unattested marks, 0% degree of association is 16.7% – 0% = 16.7%
Relation to group B:	3 common marks, 8.1%; 1 unattested mark, 2.7% degree of association is 8.1% – 2.7% = 5.4%
Relation to group C:	4 common marks, 8.2%; 0 unattested marks, 0% degree of association is 8.2% – 0 = 8.2%
Relation to group D:	1 common mark, 3.5%; 3 unattested marks, 10.4% degree of association is 3.5% – 10.4% = -6.9%

2.2.7 Ostraca attributable to group B

Seven ostraca, and perhaps four others, are attributed to group B, suggesting they date to the period of Amenhotep II.

O. Varille 423

The ostracon is incompletely preserved. It displays 21 marks in total, some of which are repeated. It contains 16 unique marks. Marks $\overline{\text{𐀓}}$, $\overline{\text{𐀔}}$, $\overline{\text{𐀕}}$ and $\overline{\text{𐀖}}$ are found in all four groups; $\overline{\text{𐀗}}$

and \uparrow are found in groups A, B and C; mark Γ is found in group C, and perhaps A if it is indeed an allomorph of Γ ; marks Ψ , \uparrow and \smile are found in groups B, C and D; marks \boxplus , \uparrow , δ , and \uparrow occur in both group B and group C; mark ϖ is found exclusively in group B. Comparing the calculated degrees of association it becomes clear that the marks on O. Varille 423 are closest related to group B:

Relation to group A:	7 or 8 common marks, 29.2% or 33.3%; 9 or 8 unattested marks, 37.5% or 33.3%
	degree of association is 29.2% – 37.5% = -8.3% or 33.3% – 33.3% = 0%
Relation to group B:	15 common marks, 40.5%; 1 unattested mark, 2.7%
	degree of association is 40.5% – 2.7% = 37.8%
Relation to group C:	15 common marks, 30.6%; 1 unattested mark, 2.0%
	degree of association is 30.6% – 2.0% = 28.6%
Relation to group D:	8 common marks, 27.6%; 8 unattested marks, 27.6%
	degree of association is 27.6% – 27.6% = 0%

Another indication that O. Varille 423 should be attributed to group B is the sequence of its marks, which is closely related to the sequence found in ostraca O. Cairo CG 24105 and O. Cairo CG 24107. Explaining the similarity between the sequence of marks on O. Varille 423 and the two ostraca from group B is difficult because of the repetition of some marks on O. Varille 423 (see TABLE 12). The first line of the ostrakon is read from right to left. It begins with \uparrow , followed by δ , after which \uparrow appears again. The sequence $\delta - \uparrow$ is found in O. Cairo CG 24105 and 24107 as well. O. Varille 423 then continues with \smile . On O. Cairo CG 24105 and 24107 the marks \parallel and \ddagger stand between δ and \uparrow , but these marks are absent on O. Varille 423. O. Varille 423 continues with \circ , which is a mark that belongs in group B but that is absent in O. Cairo CG 24105 and O. Cairo 24107. The sequence of O. Varille 423 continues with \uparrow and \boxplus , which are found together in O. Cairo CG 24105; after that follow on the second line – which is read from left to right – what appear to be marks \uparrow and \uparrow . Mark \uparrow is thus repeated. On O. Cairo CG 24105 and O. Cairo 24107 both marks do appear next to each other, but in a reversed order. After that, the sequence of O. Varille 423 is fully in accord with O. Cairo CG 24107: $\boxplus - \varpi - \uparrow - \Delta - \uparrow - \Psi - \delta$. The traces after δ on O. Varille 423 could be part of the mark ϕ , which should be the subsequent mark according to O. Cairo CG 24017. The marks Γ and δ below the second line do not fit in the sequence of marks in O. Cairo CG 24105 and O. Cairo CG 24107.

CG 24107	\uparrow	δ	\uparrow	\parallel	\ddagger	\smile	\square	\top	\uparrow	\uparrow	\boxplus	\boxplus	\top	\boxplus	ϖ	\uparrow	Δ	\uparrow	ϖ	\boxtimes	ϕ	\uparrow	\uparrow	\uparrow
CG 24105	\uparrow	δ	\uparrow	\parallel	\ddagger	\smile	\square	\top	\uparrow	\uparrow	\boxplus	\boxplus	\top	\boxplus	ϖ	\uparrow	Δ	\uparrow	ϖ	\boxtimes	ϕ	\uparrow	\uparrow	\uparrow
Varille 423		δ	Γ	\uparrow	\smile	\circ	\uparrow	\boxplus	\uparrow	\uparrow				\boxplus	ϖ	\uparrow	Δ	\uparrow	Ψ	δ				

TABLE 12. SEQUENCE OF MARKS ON O. CAIRO CG 24107, CG 24105 AND O. VARILLE 423

O. KV 10004

This ostrakon is incompletely preserved. It probably displays 24 marks, of which 19 can be identified. The order of marks on O. KV 10004 is not known from other ostraca, except for perhaps the sequence $\top - \square - \uparrow$, which is reminiscent of the sequence $\square - \top - \uparrow$ in O. Cairo CG 24105 and O. Cairo 24107. Marks \circ , \boxtimes , Δ and \boxplus are present in all four groups; marks δ , and \top , are attested in groups A, B and C; mark \smile is found in group A, C and D; marks Ψ , \smile , \top and \boxplus are found in groups B, C and D; marks δ and \uparrow occur in groups B and C; mark \uparrow is found in group B and D; marks \uparrow , \parallel and \square are found in group B only; and

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marks λ and β are only attested in group C. The calculated degrees of association indicate that the marks on O. KV 10004 are closest related to group B:

Relation to group A:	7 common marks, 29.2%; 12 unattested marks, 50.0% degree of association is 29.2% – 50.0% = -20.8%
Relation to group B:	16 common marks, 43.2%; 3 unattested marks, 8.1% degree of association is 43.2% – 8.1% = 35.1%
Relation to group C:	15 common marks, 30.6%; 4 unattested marks, 8.2% degree of association is 30.6% - 8.2% = 22.4%
Relation to group D:	10 common marks, 34.5%; 9 unattested marks, 31.0% degree of association is 34.5% – 31.0% = 3.5%

O. MMA 09.184.770

This ostrakon appears to have been preserved in its entirety, but not all marks are clearly visible. O. MMA 09.184.770 displays at least 12 marks, of which two marks are illegible. Furthermore, the interpretation of three marks is difficult. Firstly, there is mark δ of which the lower half is not well preserved. It might be seen as an allomorph of δ , but this is uncertain. We will encounter mark δ later on an ostrakon that clearly belongs to group C (O. UC 31988), where its interpretation is uncertain as well, although its position in a sequence of marks would support its interpretation as an allomorph of δ . In the ostraca discussed so far, mark ω has not been encountered. One might be inclined to interpret this mark as an allomorph form of ω , but that cannot be proven. Mark π has not been encountered before either. It is similar to, but probably distinguishable from mark π in O. Cairo JE 72490. Mark τ is interpreted as a form of the mark τ in analogy with the allomorph of this mark found on O. Cairo CG 24107. Similarly, mark ϵ must be an allomorph of the mark ϵ , cf. O. Cairo CG 24107. Comparing the marks on O. MMA 09.184.770, we find that δ occurs in groups A, B and C if it is interpreted as an allomorph form of δ ; mark ω occurs in groups B and C, if it is interpreted as ω ; ω is attested in groups B, D and C; τ is attested in group A only, but if it is an allomorph τ of it occurs also in group C; λ is attested in group C only; and marks ϵ , β , ω and τ are found in group B exclusively; mark π and perhaps marks δ and ω (when not interpreted as variant forms of marks from the core groups A, B and C) are not found in any of the groups. Despite all factors of uncertainty, the legible marks on O. MMA 09.184.770 are strongly related to group B:

Relation to group A:	1 or 2 common marks, 4.2% or 8.3%; 9 or 8 unattested marks, 37.5% or 33.3% degree of association is 4.2% – 37.5% = -33.3% or 8.3% – 33.3% = -25.0%
Relation to group B:	5 or 7 common marks, 13.5% or 18.9% 5 or 3 unattested marks, 13.5% or 8.1% degree of association is 13.5% – 13.5% = 0% or 18.9% – 8.1% = 10.8%
Relation to group C:	2 or 4 common marks, 4.1% or 8.2%; 8 or 6 unattested marks, 16.3% or 12.3% degree of association is 4.1% – 16.3% = -12.2 or 8.2% – 12.3% = -4.1%
Relation to group D:	2 or 3 common marks, 6.9% or 10.3% 8 or 7 unattested marks, 27.6% or 24.1% deg. of association is 6.9% – 27.6% = -20.7% or 10.3% – 24.1% = -13.8%

When we consider only the marks of which the interpretation is certain, we are left with marks 𐀀, 𐀁, 𐀂, 𐀃, 𐀄, 𐀅, 𐀆 and 𐀇. Of these eight marks, five are found in group B, and a sixth mark 𐀁 is found in an ostrakon attributed to group B (O. KV 10004). Mark 𐀀 is found in group A only and the final mark 𐀇 is not found in any of the core groups. An attribution of O. MMA 08.184.770 to group B thus seems probable. Because the attribution is in part based on a parallel with O. KV 10004, itself attributed toward the end of period of group B ostraca, O. MMA 09.184.770 should date around the same time.

ONL 6630

This piece is badly damaged, but four marks can be discerned. On the right edge we see the left end of mark 𐀃, and above it we recognise traces of mark 𐀆. Both marks are attested in adjacent positions on O. Cairo JE 96650, which also includes mark 𐀁. It should therefore not come as a surprise that ONL 6630 is closely related to group B. All marks are found in this group, and the degree of association is by far highest for group B. ONL 6630 is thus dated to the reign of Amenhotep II.

Relation to group A:	1 common mark, 4.2%; 3 unattested marks, 12.5% degree of association is 4.2% – 12.5% = -8.3%
Relation to group B:	4 common marks, 10.8%; 0 unattested marks, 0% degree of association is 10.8% – 0% = 10.8%
Relation to group C:	0 common marks, 0%; 4 unattested marks, 8.2% degree of association is 0% – 8.2% = -8.2%
Relation to group D:	1 common mark, 3.5%; 3 unattested marks, 10.4% degree of association is 3.5% – 10.4% = -6.9%

ONL 6302

This ostrakon is preserved in its entirety and displays 16 different marks. The rightmost mark in the upper row seems to be an elaborate form of the mirror-shaped mark 𐀁. The third line is very interesting, because if read from right to left, it lists marks in the same relative position as in the sequence of O. Cairo CG 24107: marks 𐀁, 𐀂, 𐀃, 𐀄 and 𐀅 on ONL 6302 are situated on O. Cairo CG 24107 in slots 5, 9, 17, 18 and 23 respectively. In this light it becomes very attractive to interpret mark 𐀃, attested in group B in this exact shape exclusively, as an allomorph of mark 𐀄. Both marks precede 𐀃 – 𐀄 in O. Cairo CG 24107 and ONL 6302 respectively. This equivalency is a priori unproblematic because mark 𐀄 is already attested in group A and continued to be used in group C. In addition there are no ostraca that feature both 𐀃 and 𐀄. Although the equivalency is probably true for the core ostraca in group B, it cannot be verified for other ostraca attributed to this group.

It is nevertheless clear that the order of marks on ONL 6302 is related to the sequence of O. Cairo CG 24107. Apart from the sequence of 𐀁 to 𐀃, marks 𐀄 and 𐀅 are inscribed in adjacent positions in both ostraca. On the basis of these striking similarities we expect ONL 6302 to date to the same period as the ostraca in group B. Indeed the degree of association with group B is high, but the degree of association with group A is slightly higher. In all likelihood ONL 6302 is still better situated in group B. That is not only suggested by the adherence to the sequence of O. Cairo CG 24107, but also by the occurrence of mark 𐀃, which is only securely attested in group B.

Relation to group A:	12 common marks, 50.0%; 4 unattested marks, 16.7% degree of association is 50.0% – 16.7% = 33.3%
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Relation to group B:	14 common marks, 37.8%; 2 unattested marks, 5.4% degree of association is 37.8% – 5.4% = 32.4%
Relation to group C:	14 common marks, 28.6%; 2 unattested marks, 4.1% degree of association is 28.6% – 4.1% = 24.5%
Relation to group D:	9 common marks, 31.0%; 7 unattested marks, 24.1% degree of association is 31.0% – 24.1% = 6.9%

ONL 6516

The total of marks that are recognisable on this ostrakon is five, but this incompletely preserved ostrakon must have originally included more marks. The marks do not seem to have been ordered in a particular sequence. The occurrence of mark 𐀀 on this ostrakon poses a problem because it is unclear if it should be interpreted as an allomorph of 𐀁 or not. We are forced to leave it out of our comparison for the moment. Based on the four remaining marks, the degree of association is highest for group B. Both marks 𐀀 and 𐀁 are attested in group B, so we are probably correct in attributing ONL 6516 to the time from which these ostraca stem.

Relation to group A:	1 common mark, 4.2%; 3 unattested marks, 12.5% degree of association is 4.2% – 12.5% = -8.3%
Relation to group B:	4 common marks, 10.8%; 0 unattested marks, 0% degree of association is 10.8% – 0% = 10.8%
Relation to group C:	2 common marks, 4.1%; 2 unattested marks, 4.1% degree of association is 4.1% – 4.1% = 0%
Relation to group D:	2 common marks, 6.9%; 2 unattested marks, 6.9% degree of association is 6.9% – 6.9% = 0%

ONL 6349

Five marks are discernable on this ostrakon fragment. The scribe of this piece does not appear to have ordered the marks in a meaningful sequence. We can probably ascribe the ostrakon to the time of Amenhotep II because all of its six marks are attested in group B. The degree of association with this group indeed is highest.

Relation to group A:	4 common marks, 16.7%; 2 unattested marks, 8.3% degree of association is 16.7% – 8.3% = 8.4%
Relation to group B:	6 common marks, 16.2%; 0 unattested marks, 0% degree of association is 16.2% – 0% = 16.2%
Relation to group C:	5 common marks, 10.2%; 1 unattested mark, 2.0% degree of association is 10.2% – 2.0% = 8.2%
Relation to group D:	4 common marks, 13.8%; 2 unattested marks, 6.9% degree of association is 13.8% – 6.9% = 6.9%

ONL 6194

The marks on ONL 6194 are neatly arranged in rows separated from each other by register lines. This gives the impression of an ordered list of workmen's marks, but unfortunately the sequence of marks is not attested on other ostraca. To make matters worse, the ostrakon is rather damaged, and only four marks can be identified with certainty: 𐀀 , 𐀁 , 𐀂 and 𐀃 . The small number of marks is an obstacle in the process of dating ONL 6194. Mark 𐀂 is

exclusively attested in group C. The degree of association is slightly higher for group B than for group C. Indeed, marks \uparrow , \downarrow , \times and \uparrow are found together on O. Cairo CG 24106 and O. Cairo CG 24107. With much hesitation, ONL 6194 is thus attributed to group B.

Relation to group A:	2 common marks, 8.3%; 2 unattested marks, 8.3% degree of association is 8.3% – 8.3% = 0%
Relation to group B:	3 common marks, 8.1%; 1 unattested mark, 2.7% degree of association is 8.1% – 2.7% = 5.4%
Relation to group C:	3 common marks, 6.1%; 1 unattested mark, 2.0% degree of association is 6.1% – 2.0% = 4.1%
Relation to group D:	2 common marks, 6.9%; 2 common marks, 6.9% degree of association is 6.9% – 6.9% = 0%

O. Cilli 278

No more than four marks are preserved: \uparrow , \star , \triangleleft and \downarrow . The latter mark is typical for group B, and despite the small number of marks, we may tentatively attribute this ostrakon to that group. Indeed, the calculated degree of association with group B is slightly higher than that of the other groups. It would thus seem that the most probable date for this piece is the time of Amenhotep II, although its provenance near the valley leading to the tomb of Thutmose III would suggest a date in that reign. Perhaps this is an indication that the ostrakon dates to the very end of the reign of Thutmose III or the beginning of the reign of Amenhotep II.

Relation to group A:	2 common marks, 8.3%; 2 unattested marks, 8.3% degree of association is 8.3% – 8.3% = 0%
Relation to group B:	3 common marks, 8.1%; 1 unattested mark, 2.7% degree of association is 8.1% – 2.7% = 5.4%
Relation to group C:	3 common marks, 6.1%; 1 unattested mark, 2.0% degree of association is 6.1% – 2.0% = 4.1%
Relation to group D:	0 common marks, 0%; 0 unattested marks, 0% degree of association is 0% – 0% = 0%

O. UC 45708

The date of O. UC 45708 poses somewhat of a dilemma. The first mark from the right is faintly preserved, and could be mark \downarrow . If this reading is correct, we encounter the sequence \downarrow – \times – ϕ – \uparrow – \star – \triangleleft . The first three marks occur in the exact same order as the sequence of O. Cairo CG 24107, and the position of mark \triangleleft , two marks removed from ϕ , is similar to its position on O. Cairo CG 24105, where it is one mark removed from ϕ . On the other hand, mark \star is not securely attested in group B. It is found in group C, as are all five other marks. The calculated degree of association of O. UC 45708 for group C is only slightly higher than for group B. The ostrakon is therefore tentatively attributed to group B on account of its sequence, but as it is related to group C as well, it might date to the reign of Thutmose IV.

Relation to group A:	3 common marks, 12.5%; 3 unattested marks, 12.5% degree of association is 12.5% – 12.5% = 0
Relation to group B:	5 common marks, 13.5%; 1 unattested mark, 2.7% degree of association is 13.5% – 2.7% = 10.8%

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Relation to group C:	6 common marks, 12.3%; 0 unattested marks, 0% degree of association is 12.3% – 0% = 12.3%
Relation to group D:	2 common marks, 6.9%; 4 unattested marks, 13.8% degree of association is 6.9% – 13.8% = -6.9%

ONL 6405

The marks on ONL 6405 are inscribed in two lines but are hardly legible. When the upper line was inscribed, the author appears to have turned the ostrakon upside down, like the scribe of O. Varille 423. The marks left of \sqcap are probably \updownarrow and Δ . The mark left of the latter mark is no longer discernible. In the lower line we can to some extent secure the reading of marks \uparrow , Ψ and λ . The latter shape is taken as an allomorph of mark \star . If we suppose that the left end of the upper line is continued at the left end of the lower line, than marks $\sqcap - \updownarrow - \Delta - \uparrow - \Psi$ are situated in the same relative position as in the sequence of O. Cairo CG 24105. The calculated degree of association is quite high for group C. Indeed, all marks on ONL 6405 are attested in this group. Since the sequence of marks appears to be similar to O. Cairo CG 24105, a piece in core group B, we may propose to attribute ONL 6405 to group B, but is probably older than the ostraca that constitute this group and dates closer towards the group C ostraca.

Relation to group A:	5 common marks, 20.8%; 3 unattested marks, 12.5% degree of association is 20.8% – 12.5% = 8.3%
Relation to group B:	6 common marks, 16.2%; 2 unattested marks, 5.4% degree of association is 16.2% – 5.4% = 10.8%
Relation to group C:	8 common marks, 16.3%; 0 unattested marks, 0% degree of association is 16.3% – 0% = 16.3%
Relation to group D:	1 common mark, 3.5%; 7 unattested marks, 24.1% degree of association 3.5% – 24.1% = -24.79

2.2.8 Ostraca attributable to groups A and B

There are two ostraca that demonstrates a strong relation to both the ostraca in group A and the ostraca in group B. They may date to the period of either group, or perhaps to a time between the two groups.

O. Parker H 5

This ostrakon is incompletely preserved and three of the marks are damaged and unrecognisable. Comparing the two existing hand copies of the ostrakon, a fourth damaged mark appears to be \curvearrowright or \curvearrowleft . Because it is not securely identified we cannot include it in our comparison. The remaining eight marks are easily identified as \equiv , \top , \updownarrow , \mathbb{H} , Ψ , \oplus , \sphericalangle and \ddagger . Mark \oplus is exclusively attested on documents from group A. O. Parker may be connected with the same group, because the degree of association with group A is considerable. The relation to group B is however stronger, as six of the eight marks are attested in this group. Additionally marks \top , \updownarrow and \mathbb{H} , adjacent on O. Parker H 5, are situated in positions 8, 10 and 11 in O. Cairo CG 24105. There is no way of telling if this is a coincidence or not. The other marks on O. Parker H 5 do adhere to the same sequence, and marks \sphericalangle and \ddagger are also found in adjacent positions on O. Cairo JE 72492 (group A). Since there is no clear indication for an attribution to specifically group A or B, O. Parker H 5 is can only be assigned to both groups.

Relation to group A:	5 common marks, 20.8%; 3 unattested marks, 12.5% degree of association is 20.8% – 12.5% = 8.3%
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Relation to group B:	6 common marks, 16.2%; 2 unattested marks, 5.4% degree of association is 16.2% – 5.4% = 10.8
Relation to group C:	6 common marks, 12.3%; 2 unattested marks, 4.1% degree of association is 12.3% – 4.1% = 8.2%
Relation to group D:	5 common marks, 17.2%; 3 unattested marks, 10.4% degree of association is 17.2% – 10.4% = 6.8%

O. Strasbourg H 193

This ostrakon is inscribed on two sides of a very narrow limestone chip, but one side is poorly preserved. It may have been inscribed with marks as well, but that cannot be verified. The other marks are well identifiable, and they are not listed in a sequence that is recorded on other ostraca. Mark 𐀓 is attested in core group D, but occurs also on ostraca attributed to the period between B and D (O. Ashmolean HO 298, O. MMA 09.184.786, ONL 6365) and on an ostrakon that is tentatively attributed to group B (O. Brock 27). Proposing a date for O. Strasbourg H 193 is problematic because apart perhaps from mark 𐀓 , it does not display marks that are characteristic for a particular core group. Rather, it includes five marks that are found in all four key groups. This in itself is perhaps an indication that O. Strasbourg H 193 should date to the middle of the period covered by our four key groups. The calculated degree of association is however highest for group A. Indeed, 10 out of the 13 marks are attested in this group. As mark 𐀓 is not securely attested that early, O. Strasbourg dates perhaps to a period between groups A and B.

Relation to group A:	10 common marks, 41.7%; 3 unattested marks, 12.5% degree of association is 41.7% – 12.5% = 28.5%
Relation to group B:	10 common marks, 27.0%; 3 unattested marks, 8.1% degree of association is 27.0% – 8.1% = 18.9%
Relation to group C:	12 common marks, 24.5%; 1 unattested mark, 2.0% degree of association is 24.5 – 2.0% = 22.5%
Relation to group D:	7 common marks, 24.1%; 6 unattested marks, 20.7% degree of association is 24.1% – 20.7% = 3.4%

2.2.9 Ostraca attributed to group C

In this section 47 ostraca are attributed to group C, datable to the reign of Amenhotep III. The attribution of 12 of these ostraca is less certain than of the other 35. Technically it is possible that some ostraca discussed in this section are slightly later and date to the end of the 18th Dynasty.³⁶ Instrumental in the process of assigning ostraca to group C are the sequences of marks on OL 6788 and O. Stockholm MM 14130. The two ostraca are clearly related to the group C material, both in terms of the number of shared marks and an adherence to the sequence of marks found on O. WV 3. Before elaborating on these sequences we will have a look at the marks which the ostraca have in common with the ostraca of group C.

OL 6788

This ostrakon appears to be completely preserved.³⁷ It displays a total of 44 marks, two of which are repeated. Comparing the 42 unique marks on the ostrakon to the marks in the core

³⁶ See below, 2.2.14.

³⁷ The ostrakon was published by Bruyère, *Rapport 1948-1951*, pl. XVIII, top left, and is referred to in earlier literature e.g. as an ostrakon “published by Bernard Bruyère” (Haring, ‘Workmen’s Marks on Ostraca’, 153) or

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groups, it becomes clear that they are strongly related to the marks in group C: all marks but 𓆎 are found in group C. Marks 𓆏 , 𓆐 , 𓆑 , 𓆒 , 𓆓 , 𓆔 , 𓆕 , 𓆖 , 𓆗 and 𓆘 are found in groups A, B and C; marks 𓆙 , 𓆚 and 𓆛 occur in both groups A and C; 𓆜 appears in group C, perhaps also in group A; marks 𓆝 , 𓆞 , 𓆟 , 𓆠 , 𓆡 , 𓆢 , 𓆣 , 𓆤 , 𓆥 and 𓆦 occur in both groups B and C; marks 𓆧 , 𓆨 , 𓆩 , 𓆪 , 𓆫 , 𓆬 , 𓆭 , 𓆮 , 𓆯 , 𓆰 , 𓆱 , 𓆲 , 𓆳 , 𓆴 , 𓆵 and 𓆶 occur only in group C; mark 𓆷 is not attested in any of the ostraca in the core groups, but can be associated with group C.³⁸ The calculated degrees of association indicate that there is a very strong relation between the marks on OL 6788 and the marks in group C:

Relation to group A:	15 common marks, 62.5%; 27 unattested marks, 112.5% degree of association is 62.5% – 112.5% = -50.0%
Relation to group B:	22 common marks, 59.5%; 20 unattested marks, 54.1% degree of association is 59.5% – 54.1% = 5.4%
Relation to group C:	41 common marks, 83.7%; 1 unattested mark, 2.0% degree of association is 83.7% – 2.0% = 81.7%
Relation to group D:	22 common marks, 75.9%; 20 unattested marks, 69.0% degree of association is 75.9% – 69.0% = 6.9%

O. Stockholm MM 14130

The ostrakon is not completely preserved. It displayed at least 31 marks, 29 of which are identifiable. Of these 29 marks there are 28 unique ones. Marks 𓆏 , 𓆐 , 𓆑 , 𓆒 , 𓆓 , 𓆔 , 𓆕 , 𓆖 , 𓆗 and 𓆘 are found in groups A, B and C; 𓆙 and 𓆚 occur in both groups A and C; 𓆜 appears in group C, perhaps also in group A; marks 𓆝 , 𓆞 , 𓆟 and 𓆠 (we shall see below that the damaged mark at the left end of the second line is probably 𓆠) occur in both groups B and C; finally, marks 𓆡 , 𓆢 , 𓆣 , 𓆤 , 𓆥 , 𓆦 , 𓆧 , 𓆨 and 𓆩 occur only in group C. The calculated degrees of association show that the relation between the marks on Stockholm MM 14130 and the marks in group C is very strong in comparison to other groups:

Relation to group A:	12 or 13 common marks, 50.0% or 54.2% 16 or 15 unattested marks, 66.7% or 62.5% degree of association is 50.0% – 66.7% = -16.7% or 54.2% – 62.5% = - 8.3%
Relation to group B:	14 common marks, 37.8%; 14 unattested marks, 37.8% degree of association is 37.8% – 37.8% = 0%
Relation to group C:	28 common marks, 57.1%; 0 unattested marks, 0% degree of association is 57.1% – 0% = 57.1%
Relation to group D:	12 common marks, 41.4%; 16 unattested marks, 55.2% degree of association is 41.4% – 55.2% = -13.8%

An indication that O. Stockholm MM 14130 belongs to group C is the fact that it displays 11 out of 28 unique marks (39.3%) that are found exclusively in group C. Moreover, when we look at absolute numbers, we see that all 28 marks on O. Stockholm MM 14130 are attested in group C. It is therefore attributed to that group.

“O. Bruyère” (Daniel Soliman, ‘The Functional Context of the 18th Dynasty Marks Ostraca from the Theban Necropolis’ in: Carl Graves, Gabrielle Heffernan, Luke McGarrity *et al.* (eds.), *Current Research in Egyptology 2012. Proceedings of the Thirteenth Annual Symposium. University of Birmingham 2012* (Oxford 2013), *passim*).

³⁸ See above, 2.2.3.

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exact same sequence on OL 6788. Both this ostrakon and O. Stockholm MM 14130 are therefore strongly related to O. WV 3, and therefore to group C.

Parts of the same sequence can be found on other ostraca of group C as well. On O. WV 10 the first line, read from right to left, displays a series of marks similar to that of OL 6788:

𐀀	𐀁	𐀂	𐀃	𐀄	𐀅	𐀆	𐀇
17	18	19	20	25	27	29	30

Another sequence is more similar to the order of O. Stockholm MM 14130:

𐀈	𐀉	𐀊	𐀋
29	30	15	14

O. WV 4 is perhaps also related to sequence of OL 6788. The marks themselves are not written in the correct sequence, but all but the mark 𐀁 belong to the beginning of the list of OL 6788. These marks are:

𐀁	𐀂	𐀃	𐀄	𐀅	𐀆	𐀇	𐀈	𐀉	𐀊	𐀋
1	3	5	6	10	11	12	13	15	16	17

We notice the influence of the fixed order also in O. WV 10, where several marks that are situated in adjacent positions in the sequence of OL 6788 are clustered together:

𐀌	𐀍	𐀎	𐀏	𐀐	𐀑	𐀒	𐀓	𐀔	𐀕	𐀖	𐀗	𐀘	𐀙	𐀚
7	20	21	34	32	35	28	16	18	37	31	38	13	24	43

ONL 6298

This document can hardly be called an ostrakon, because the marks on ONL 6298 are inscribed on the outer side of the body of a ceramic bowl with a diameter of about 28 cm. The bowl is almost entirely preserved, and 39 workmen's marks have survived. The marks are arranged in a series that spirals around the body of the bowl in a sequence that bears many similarities to the sequence of OL 6788, O. Stockholm MM 14130 and O. WV 3:

Sequence of OL 6788:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
𐀁	𐀂	𐀃	𐀄	𐀅	𐀆	𐀇	𐀈	𐀉	𐀊	𐀋	𐀌	𐀍	𐀎	𐀏	𐀐	𐀑	𐀒	𐀓	𐀔	𐀕	𐀖	𐀗	𐀘	𐀙	𐀚	𐀛	𐀜	𐀝	𐀞	𐀟	𐀠	𐀡	𐀢	𐀣	𐀤	𐀥	𐀦	𐀧	𐀨	𐀩	𐀪	𐀫	𐀬	𐀭	𐀮	𐀯	𐀰	𐀱	𐀲	𐀳	𐀴	𐀵	𐀶	𐀷	𐀸	𐀹	𐀺	𐀻	𐀼	𐀽	𐀾	𐀿	𐁀	𐁁	𐁂	𐁃	𐁄	𐁅	𐁆	𐁇	𐁈	𐁉	𐁊	𐁋	𐁌	𐁍	𐁎	𐁏	𐁐	𐁑	𐁒	𐁓	𐁔	𐁕	𐁖	𐁗	𐁘	𐁙	𐁚	𐁛	𐁜	𐁝	𐁞	𐁟	𐁠	𐁡	𐁢	𐁣	𐁤	𐁥	𐁦	𐁧	𐁨	𐁩	𐁪	𐁫	𐁬	𐁭	𐁮	𐁯	𐁰	𐁱	𐁲	𐁳	𐁴	𐁵	𐁶	𐁷	𐁸	𐁹	𐁺	𐁻	𐁼	𐁽	𐁾	𐁿	𐂀	𐂁	𐂂	𐂃	𐂄	𐂅	𐂆	𐂇	𐂈	𐂉	𐂊	𐂋	𐂌	𐂍	𐂎	𐂏	𐂐	𐂑	𐂒	𐂓	𐂔	𐂕	𐂖	𐂗	𐂘	𐂙	𐂚	𐂛	𐂜	𐂝	𐂞	𐂟	𐂠	𐂡	𐂢	𐂣	𐂤	𐂥	𐂦	𐂧	𐂨	𐂩	𐂪	𐂫	𐂬	𐂭	𐂮	𐂯	𐂰	𐂱	𐂲	𐂳	𐂴	𐂵	𐂶	𐂷	𐂸	𐂹	𐂺	𐂻	𐂼	𐂽	𐂾	𐂿	𐃀	𐃁	𐃂	𐃃	𐃄	𐃅	𐃆	𐃇	𐃈	𐃉	𐃊	𐃋	𐃌	𐃍	𐃎	𐃏	𐃐	𐃑	𐃒	𐃓	𐃔	𐃕	𐃖	𐃗	𐃘	𐃙	𐃚	𐃛	𐃜	𐃝	𐃞	𐃟	𐃠	𐃡	𐃢	𐃣	𐃤	𐃥	𐃦	𐃧	𐃨	𐃩	𐃪	𐃫	𐃬	𐃭	𐃮	𐃯	𐃰	𐃱	𐃲	𐃳	𐃴	𐃵	𐃶	𐃷	𐃸	𐃹	𐃺	𐃻	𐃼	𐃽	𐃾	𐃿	𐄀	𐄁	𐄂	𐄃	𐄄	𐄅	𐄆	𐄇	𐄈	𐄉	𐄊	𐄋	𐄌	𐄍	𐄎	𐄏	𐄐	𐄑	𐄒	𐄓	𐄔	𐄕	𐄖	𐄗	𐄘	𐄙	𐄚	𐄛	𐄜	𐄝	𐄞	𐄟	𐄠	𐄡	𐄢	𐄣	𐄤	𐄥	𐄦	𐄧	𐄨	𐄩	𐄪	𐄫	𐄬	𐄭	𐄮	𐄯	𐄰	𐄱	𐄲	𐄳	𐄴	𐄵	𐄶	𐄷	𐄸	𐄹	𐄺	𐄻	𐄼	𐄽	𐄾	𐄿	𐅀	𐅁	𐅂	𐅃	𐅄	𐅅	𐅆	𐅇	𐅈	𐅉	𐅊	𐅋	𐅌	𐅍	𐅎	𐅏	𐅐	𐅑	𐅒	𐅓	𐅔	𐅕	𐅖	𐅗	𐅘	𐅙	𐅚	𐅛	𐅜	𐅝	𐅞	𐅟	𐅠	𐅡	𐅢	𐅣	𐅤	𐅥	𐅦	𐅧	𐅨	𐅩	𐅪	𐅫	𐅬	𐅭	𐅮	𐅯	𐅰	𐅱	𐅲	𐅳	𐅴	𐅵	𐅶	𐅷	𐅸	𐅹	𐅺	𐅻	𐅼	𐅽	𐅾	𐅿	𐆀	𐆁	𐆂	𐆃	𐆄	𐆅	𐆆	𐆇	𐆈	𐆉	𐆊	𐆋	𐆌	𐆍	𐆎	𐆏	𐆐	𐆑	𐆒	𐆓	𐆔	𐆕	𐆖	𐆗	𐆘	𐆙	𐆚	𐆛	𐆜	𐆝	𐆞	𐆟	𐆠	𐆡	𐆢	𐆣	𐆤	𐆥	𐆦	𐆧	𐆨	𐆩	𐆪	𐆫	𐆬	𐆭	𐆮	𐆯	𐆰	𐆱	𐆲	𐆳	𐆴	𐆵	𐆶	𐆷	𐆸	𐆹	𐆺	𐆻	𐆼	𐆽	𐆾	𐆿	𐇀	𐇁	𐇂	𐇃	𐇄	𐇅	𐇆	𐇇	𐇈	𐇉	𐇊	𐇋	𐇌	𐇍	𐇎	𐇏	𐇐	𐇑	𐇒	𐇓	𐇔	𐇕	𐇖	𐇗	𐇘	𐇙	𐇚	𐇛	𐇜	𐇝	𐇞	𐇟	𐇠	𐇡	𐇢	𐇣	𐇤	𐇥	𐇦	𐇧	𐇨	𐇩	𐇪	𐇫	𐇬	𐇭	𐇮	𐇯	𐇰	𐇱	𐇲	𐇳	𐇴	𐇵	𐇶	𐇷	𐇸	𐇹	𐇺	𐇻	𐇼	𐇽	𐇾	𐇿	𐈀	𐈁	𐈂	𐈃	𐈄	𐈅	𐈆	𐈇	𐈈	𐈉	𐈊	𐈋	𐈌	𐈍	𐈎	𐈏	𐈐	𐈑	𐈒	𐈓	𐈔	𐈕	𐈖	𐈗	𐈘	𐈙	𐈚	𐈛	𐈜	𐈝	𐈞	𐈟	𐈠	𐈡	𐈢	𐈣	𐈤	𐈥	𐈦	𐈧	𐈨	𐈩	𐈪	𐈫	𐈬	𐈭	𐈮	𐈯	𐈰	𐈱	𐈲	𐈳	𐈴	𐈵	𐈶	𐈷	𐈸	𐈹	𐈺	𐈻	𐈼	𐈽	𐈾	𐈿	𐉀	𐉁	𐉂	𐉃	𐉄	𐉅	𐉆	𐉇	𐉈	𐉉	𐉊	𐉋	𐉌	𐉍	𐉎	𐉏	𐉐	𐉑	𐉒	𐉓	𐉔	𐉕	𐉖	𐉗	𐉘	𐉙	𐉚	𐉛	𐉜	𐉝	𐉞	𐉟	𐉠	𐉡	𐉢	𐉣	𐉤	𐉥	𐉦	𐉧	𐉨	𐉩	𐉪	𐉫	𐉬	𐉭	𐉮	𐉯	𐉰	𐉱	𐉲	𐉳	𐉴	𐉵	𐉶	𐉷	𐉸	𐉹	𐉺	𐉻	𐉼	𐉽	𐉾	𐉿	𐊀	𐊁	𐊂	𐊃	𐊄	𐊅	𐊆	𐊇	𐊈	𐊉	𐊊	𐊋	𐊌	𐊍	𐊎	𐊏	𐊐	𐊑	𐊒	𐊓	𐊔	𐊕	𐊖	𐊗	𐊘	𐊙	𐊚	𐊛	𐊜	𐊝	𐊞	𐊟	𐊠	𐊡	𐊢	𐊣	𐊤	𐊥	𐊦	𐊧	𐊨	𐊩	𐊪	𐊫	𐊬	𐊭	𐊮	𐊯	𐊰	𐊱	𐊲	𐊳	𐊴	𐊵	𐊶	𐊷	𐊸	𐊹	𐊺	𐊻	𐊼	𐊽	𐊾	𐊿	𐋀	𐋁	𐋂	𐋃	𐋄	𐋅	𐋆	𐋇	𐋈	𐋉	𐋊	𐋋	𐋌	𐋍	𐋎	𐋏	𐋐	𐋑	𐋒	𐋓	𐋔	𐋕	𐋖	𐋗	𐋘	𐋙	𐋚	𐋛	𐋜	𐋝	𐋞	𐋟	𐋠	𐋡	𐋢	𐋣	𐋤	𐋥	𐋦	𐋧	𐋨	𐋩	𐋪	𐋫	𐋬	𐋭	𐋮	𐋯	𐋰	𐋱	𐋲	𐋳	𐋴	𐋵	𐋶	𐋷	𐋸	𐋹	𐋺	𐋻	𐋼	𐋽	𐋾	𐋿	𐌀	𐌁	𐌂	𐌃	𐌄	𐌅	𐌆	𐌇	𐌈	𐌉	𐌊	𐌋	𐌌	𐌍	𐌎	𐌏	𐌐	𐌑	𐌒	𐌓	𐌔	𐌕	𐌖	𐌗	𐌘	𐌙	𐌚	𐌛	𐌜	𐌝	𐌞	𐌟	𐌠	𐌡	𐌢	𐌣	𐌤	𐌥	𐌦	𐌧	𐌨	𐌩	𐌪	𐌫	𐌬	𐌭	𐌮	𐌯	𐌰	𐌱	𐌲	𐌳	𐌴	𐌵	𐌶	𐌷	𐌸	𐌹	𐌺	𐌻	𐌼	𐌽	𐌾	𐌿	𐍀	𐍁	𐍂	𐍃	𐍄	𐍅	𐍆	𐍇	𐍈	𐍉	𐍊	𐍋	𐍌	𐍍	𐍎	𐍏	𐍐	𐍑	𐍒	𐍓	𐍔	𐍕	𐍖	𐍗	𐍘	𐍙	𐍚	𐍛	𐍜	𐍝	𐍞	𐍟	𐍠	𐍡	𐍢	𐍣	𐍤	𐍥	𐍦	𐍧	𐍨	𐍩	𐍪	𐍫	𐍬	𐍭	𐍮	𐍯	𐍰	𐍱	𐍲	𐍳	𐍴	𐍵	𐍶	𐍷	𐍸	𐍹	𐍺	𐍻	𐍼	𐍽	𐍾	𐍿	𐎀	𐎁	𐎂	𐎃	𐎄	𐎅	𐎆	𐎇	𐎈	𐎉	𐎊	𐎋	𐎌	𐎍	𐎎	𐎏	𐎐	𐎑	𐎒	𐎓	𐎔	𐎕	𐎖	𐎗	𐎘	𐎙	𐎚	𐎛	𐎜	𐎝	𐎞	𐎟	𐎠	𐎡	𐎢	𐎣	𐎤	𐎥	𐎦	𐎧	𐎨	𐎩	𐎪	𐎫	𐎬	𐎭	𐎮	𐎯	𐎰	𐎱	𐎲	𐎳	𐎴	𐎵	𐎶	𐎷	𐎸	𐎹	𐎺	𐎻	𐎼	𐎽	𐎾	𐎿	𐏀	𐏁	𐏂	𐏃	𐏄	𐏅	𐏆	𐏇	𐏈	𐏉	𐏊	𐏋	𐏌	𐏍	𐏎	𐏏	𐏐	𐏑	𐏒	𐏓	𐏔	𐏕	𐏖	𐏗	𐏘	𐏙	𐏚	𐏛	𐏜	𐏝	𐏞	𐏟	𐏠	𐏡	𐏢	𐏣	𐏤	𐏥	𐏦	𐏧	𐏨	𐏩	𐏪	𐏫	𐏬	𐏭	𐏮	𐏯	𐏰	𐏱	𐏲	𐏳	𐏴	𐏵	𐏶	𐏷	𐏸	𐏹	𐏺	𐏻	𐏼	𐏽	𐏾	𐏿	𐐀	𐐁	𐐂	𐐃	𐐄	𐐅	𐐆	𐐇	𐐈	𐐉	𐐊	𐐋	𐐌	𐐍	𐐎	𐐏	𐐐	𐐑	𐐒	𐐓	𐐔	𐐕	𐐖	𐐗	𐐘	𐐙	𐐚	𐐛	𐐜	𐐝	𐐞	𐐟	𐐠	𐐡	𐐢	𐐣	𐐤	𐐥	𐐦	𐐧	𐐨	𐐩	𐐪	𐐫	𐐬	𐐭	𐐮	𐐯	𐐰	𐐱	𐐲	𐐳	𐐴	𐐵	𐐶	𐐷	𐐸	𐐹	𐐺	𐐻	𐐼	𐐽	𐐾	𐐿	𐑀	𐑁	𐑂	𐑃	𐑄	𐑅	𐑆	𐑇	𐑈	𐑉	𐑊	𐑋	𐑌	𐑍	𐑎	𐑏	𐑐	𐑑	𐑒	𐑓	𐑔	𐑕	𐑖	𐑗	𐑘	𐑙	𐑚	𐑛	𐑜	𐑝	𐑞	𐑟	𐑠	𐑡	𐑢	𐑣	𐑤	𐑥	𐑦	𐑧	𐑨	𐑩	𐑪	𐑫	𐑬	𐑭	𐑮	𐑯	𐑰	𐑱	𐑲	𐑳	𐑴	𐑵	𐑶	𐑷	𐑸	𐑹	𐑺	𐑻	𐑼	𐑽	𐑾	𐑿	𐒀	𐒁	𐒂	𐒃	𐒄	𐒅	𐒆	𐒇	𐒈	𐒉	𐒊	𐒋	𐒌	𐒍	𐒎	𐒏	𐒐	𐒑	𐒒	𐒓	𐒔	𐒕	𐒖	𐒗	𐒘	𐒙	𐒚	𐒛	𐒜	𐒝	𐒞	𐒟	𐒠	𐒡	𐒢	𐒣	𐒤	𐒥	𐒦	𐒧	𐒨	𐒩	𐒪	𐒫	𐒬	𐒭</

at some points from that of OL 6788 the former ostrakon originates probably from a somewhat earlier or later period.³⁹

One of the marks that does not occur on OL 6788 is 𓆎 , situated on ONL 6298 in a slot that suggests it is an allomorph of mark 𓆏 . Both marks look rather similar, so it would a priori not be problematic to equate the two if it was not for O. WV 12. Mark 𓆎 is also present in this document, but in the line above it mark 𓆏 is recorded, indicating the two marks need to be distinguished. Therefore the occurrence of mark 𓆎 in the slot of 𓆏 on ONL 6298 may be wholly coincidental. Mark 𓆑 is not attested on any of the ostraca that constitute group C, and it does not appear on O. Stockholm MM 14130 and OL 6788 either. The mark is differentiated from 𓆒 , found higher up in the sequence of ONL 6298. At the beginning of the sequence we observe mark 𓆓 , which we recognise as the mark of Kha. His mark is not often found on ostraca together with other marks, but we had encountered it on O. Cairo JE 72490, which is of a much earlier date. Attributing ONL 6298 to group C would situate the document approximately in the reign of Amenhotep III. Kha must certainly have been active during this period, and therefore mark 𓆓 is likely to refer to this person.

O. UC 45709

This fragment displays six marks, four of which are completely preserved. The damaged marks can, however, be recognised, because all marks seem to fit perfectly in the sequence found on OL 6788 and O. Stockholm MM 14130. The first line of O. UC 45709, when read from right to left, shows the beginning of the sequence of OL 6788: mark 𓆔 is inscribed twice and then follows mark 𓆕 , as in OL 6788. In the sequence of the latter ostrakon, the next mark is 𓆖 . What remains on O. UC 45709 of the mark after 𓆕 would indeed agree with 𓆖 . In the second line of O. UC 45709 we see mark 𓆗 . This mark is absent in OL 6788, but it is present in O. WV 3 and O. Stockholm MM 14130, where it is followed by 𓆘 . Again the remains of the mark on O. UC 45709 fit a reconstruction of 𓆘 . The ostrakon thus seems to record a sequence that is very similar to that of O. WV 3, OL 6788 and O. Stockholm MM 14130, and must therefore be attributed to group C:

𓆔	𓆔	𓆕	𓆖		𓆗	𓆘
1	2	3	4		45	24

When one accepts the reconstruction of marks 𓆖 and 𓆘 , all of the surviving marks on O. UC 45709 are found in group C, whereas only 𓆔 occurs in group A, and only 𓆕 , 𓆘 and 𓆖 are found in group B. Calculating the degrees of association confirms that the few visible marks on the ostrakon are closest related to those of group C:

Relation to group A:	1 common mark, 4.2%; 4 unattested marks, 16.7% degree of association is 4.2% – 16.7% = -12.5%
Relation to group B:	3 common marks, 8.1%; 2 unattested marks, 5.4% degree of association is 8.1% – 5.4% = 2.7%
Relation to group C:	5 common marks, 10.2%; 0 unattested marks, 0% degree of association is 10.2% – 0% = 10.2%
Relation to group D:	2 common marks, 6.9%; 3 unattested marks, 10.4% degree of association is 6.9% – 10.4% = -3.5%

³⁹ The presence of mark 𓆓 on ONL 6298 suggests that it dates to an earlier date than OL 6788, see below, 2.6.5.

O. Ashmolean HO 1114

This ostrakon appears to have been completely preserved. It displays a total of 15 marks and 10 unique marks. The ostrakon is written in two lines, which appear to record separate data, suggested by the repetition of marks. Marks \uparrow , \boxtimes and Υ are found in groups A, B and C; mark \star is attested in groups A and C; marks \top and \wp are found in groups B and C; and marks $\uparrow\uparrow$, \curvearrowright , \sqcap , \times are found in group C exclusively. Indeed, all marks on O. Ashmolean HO 1114 are attested in group C, and so the marks on this ostrakon are strongly related to the marks on the ostraca in group C. That is also suggested by the calculated degree of association:

Relation to group A:	4 common marks, 16.7%; 6 unattested marks, 25.0% degree of association is 16.7% – 25.0% = -8.3%
Relation to group B:	5 common marks, 13.5%; 5 unattested marks, 13.5% degree of association is 13.5% – 13.5% = 0%
Relation to group C:	10 common marks, 20.4%; 0 unattested marks, 0% degree of association is 20.4% – 0% = 20.4%
Relation to group D:	7 common marks, 24.1%; 3 unattested marks, 10.4% degree of association is 24.1% – 10.4% = 13.7%

Looking at the sequence in which the marks occur, we find more evidence to attribute O. Ashmolean HO 1114 to group C. As the ostrakon seems to be complete, it records a much smaller number, perhaps a smaller selection, of workmen's marks, than ostraca such as O. WV 3 and O. Stockholm MM 14130. Yet, it appears that many of the marks on O. Ashmolean HO 1114 are inscribed in agreement with their position in the ordered sequence found on ostraca such as O. WV 3 and O. Stockholm MM 14130. This is particularly true for the marks in the second line of O. Ashmolean HO 1114, which when read from right to left appear in the same relative position in the sequence of O. Stockholm MM 14130.

Line 2:

\star	$\uparrow\uparrow$	\uparrow	\uparrow	\curvearrowright	\sqcap	\times
1	45	37	38	39	41	43

The order of marks in the first line, when read from right to left, agrees better with O. WV 3 and OL 6788, with the exception of the second instance of Υ written above mark \boxtimes . Moreover, on O. Ashmolean HO 1114 mark \boxtimes appears before \times , whereas in OL 6788 it is \times that appears before \boxtimes .

Line 1:

Υ	\wp	\top	\curvearrowright	\sqcap	Υ	\boxtimes	\times
14	24	26	39	41	14	44	43

O. MMA 09.184.700

The contours of the ostrakon and some of its marks are damaged, but it is unclear whether any marks are lost. In its current state the ostrakon displays 15 marks. One of the marks, \wp , has been erased but is still visible. Mark \star is not entirely clear, but is here interpreted as \sqcap . The mark at the right end of the third line is probably ϕ . Comparing the order of the marks, we notice that it partially resembles the sequence of ostraca from group C, such as OL 6788.

The marks in the upper line correspond to positions 3, 5 and 6; the superimposed marks \curvearrowright and \star correspond to positions 7 and 8; mark ϕ right of this group and Υ mark to the left are

positions 11 and 14 respectively; the remaining marks are mostly found in the third quarter of the sequence of OL 6788 (positions 21-22, 24, 27-30, 44) and are inscribed in almost the same sequence. The similarities with the series of marks on OL 6788 suggest that O. MMA 09.184.700 should be attributed to group C. The high degree of association with group C points in the same direction.

Relation to group A:	4 common marks, 16.7%; 11 unattested marks, 45.8% degree of association is 16.7% – 45.8% = -29.1%
Relation to group B:	9 common marks, 24.3%; 6 unattested marks, 16.2% degree of association is 24.3% – 16.2% = 8.1%
Relation to group C:	15 common marks, 30.6%; 0 unattested marks, 0% degree of association is 30.6% – 0% = 30.6%
Relation to group D:	10 common marks, 34.5%; 5 unattested marks, 17.2% degree of association is 34.5% – 17.2% = 17.3%

O. UC 31988

This ostrakon is completely preserved but unfortunately it is very weathered. It displays a total of 23 marks, but several are unclear. The marks in the top section of the obverse – written upside down from the rest of this face of the ostrakon – appear to be Δ , then perhaps \curvearrowright upside down, and then Υ . The mark after that is damaged but seems to be \triangleleft . Then follows \boxplus , and after that comes mark σ . The latter mark is not attested on any of the four core groups. Because of its specific position on this ostrakon there is reason to believe that it is an allomorph of δ , but that is far from certain. In the section below the line we find λ , Γ , \circ , \mathcal{A} , \mathcal{B} , \mathcal{C} , \mathcal{D} , and then what seems to be \imath . This is probably not the same mark as Γ , which is differently executed in the line above. The mark is reminiscent of Γ in O. Cairo JE 72948, but it might also be $\dot{\imath}$ or $\dot{\iota}$. As demonstrated below, the former mark seems to be the most plausible. Then follow marks Γ and Ξ , and the next mark μ is unclear. The mark is written on the lower edge of the ostrakon, and the scribe's pen may have slipped a bit at this point. It is perhaps mark Υ with a very short vertical stem. The reverse of the ostrakon displays six more marks. The first mark appears to be an upside down ρ , probably for δ . The next mark is λ , here probably not used as an allomorph of mark Ψ , because the order of marks on O. UC 31988 partly resembles the sequence of OL 6788, the ostrakon in which mark λ is differentiated from Ψ . The following mark is perhaps \mathcal{B} . The leftmost mark in the line below is \mathcal{H} , and the damaged mark next to it is perhaps \mathcal{K} . Finally there is a damaged mark at the bottom that cannot be identified.

It should be emphasised that the identification of several of the marks is uncertain, but if we consider them as a working hypothesis, we get the impression that the ostrakon is closely related to group C. All of the marks are attested in this group, and the degree of association is by far the highest:

Relation to group A:	10 common marks, 41.7%; 12 unattested marks, 50.0% degree of association is 41.7% – 50.0% = -8.3%
Relation to group B:	11 common marks, 29.7%; 11 common marks, 29.7% degree of association is 29.7% – 29.7% = 0%
Relation to group C:	22 common marks, 44.9%; 0 unattested marks, 0% degree of association is 44.9% – 0% = 44.9%
Relation to group D:	8 common marks, 27.6%; 14 unattested marks, 51.9% degree of association is 27.6% – 51.9% = -24.3%

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The suspicion that O. UC 31988 belongs in group C is confirmed by the sequence of marks in the second line: marks $\lambda - \Gamma - \bigcirc - \lambda - \text{ø} - \gamma\Gamma$ are found in almost the exact same order on OL 6788, O. WV 3 and related ostraca. The other marks do not adhere to the same sequence, but the influence of the sequence can be detected. The identified marks of our working hypothesis are situated in the following positions on OL 6788:

obv. line 1: 13 – 3 – 4 – 14 – 6 – 7
 obv. line 2: 16 – 18 – 19 – 20 – 21 – 22
 obv. line 3: 28 – 31 – 32 – 35 – 23
 rev. line 1: 34 – 9 – 5
 rev. line 2: (?) – 1 – 25.

Together, the marks correspond to slots 1, 3-7, 9, 13-14, 15, 18-23, 25, 28, 31-32, and 34-35. The tentatively identified marks would fit well into the sequence of OL 6788, which in turn is in agreement with the attribution of the securely identified marks to group C. O. UC 31988 should therefore have been inscribed in the reign of Amenhotep III.

ONL 6342

The marks on this ostrakon are evidently related to OL 6788 and therefore to group C. All marks are attested in this group, and they are inscribed in accordance with their relative position in the sequence of OL 6788. Indeed, the degree of association with group C is the highest of all groups. We conclude that ONL 6342 should be attributed to the reign of Amenhotep III.

Relation to group A:	3 common marks, 12.5%; 2 unattested marks, 8.3% degree of association is 12.5% – 8.3% = 4.2%
Relation to group B:	3 common marks, 8.1%; 2 unattested marks, 5.4% degree of association is 8.1% – 5.4% = 2.7%
Relation to group C:	5 common marks, 10.2%; 0 unattested marks, 0% degree of association is 10.2% – 0% = 10.2%
Relation to group D:	3 common marks, 10.4%; 2 unattested marks, 6.9% degree of association is 10.4% – 6.9% = 3.5%

ONL 6410

The marks on ONL 6410 do not appear in an ordered sequence that is attested on other pieces. Marks δ and Γ are found in adjacent positions on O. Varille 423, but other than that the sequences of both pieces do not seem to be related. Mark $\hat{\Gamma}$ is not attested on any of the ostraca from the core groups, but appears on other pieces from the 18th Dynasty.⁴⁰ Depending on whether Γ is an allomorph of $\hat{\Gamma}$, ONL 6410 shares either two or three marks with group A. The degree of association is however highest for group C, six marks of which are present on ONL 6410.

Relation to group A:	2 or 3 common marks, 8.3% or 12.5% 5 or 4 unattested marks, 20.8% or 16.7% degree of association is 8.3% – 20.8% = -12.5% or 12.5% – 16.7% = -4.2%
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⁴⁰ ONL 6579 and ONL 6564, both of uncertain date, see below, p. 119.

Relation to group B:	3 common marks, 8.1%; 4 unattested marks, 10.8% degree of association is 8.1% – 10.8% = -2.7%
Relation to group C:	6 common marks, 12.3%; 1 unattested mark, 2.0% degree of association is 12.3% – 2.0% = 10.3%
Relation to group D:	4 common marks, 13.8%; 3 unattested marks, 10.4% degree of association is 13.8% – 10.4% = 3.4%

ONL 6372

The ostrakon is inscribed with a set of marks of which three or four are too damaged to be identified. A faint mark in the lower left corner is perhaps mark Ψ . In spite of its damaged state, the ostrakon can easily be dated on account of the order in which the marks are inscribed. Marks $\text{𓆎} - \text{𓆏} - \text{𓆐}$ appear in that order in the sequence of OL 6788; marks $\text{𓆑} - \text{𓆒} - \text{𓆓}$ are also attested in the sequence of OL 6788 and on O. WV 3; 𓆔 and 𓆕 are adjacent as well in OL 6788 and the sequence of ONL 6298. ONL 6372 is thus evidently associated with ostraca from group C. Calculating the degree of association to all groups adds to the argument: ONL 6372 is closest related to group C, and is therefore attributable to the reign of Amenhotep III.

Relation to group A:	3 common marks, 12.5%; 7 unattested marks, 29.2% degree of association is 12.5% – 29.2% = -16.7%
Relation to group B:	6 common marks, 16.2%; 4 unattested marks, 10.8% degree of association is 16.2% – 10.8% = 5.4%
Relation to group C:	10 common marks, 20.4%; 0 unattested marks, 0% degree of association is 20.4% – 0% = 20.4%
Relation to group D:	5 common marks, 17.2%; 5 common marks, 17.2% degree of association is 17.2% – 17.2% = 0%

ONL 6400

The four marks on this piece are in all probability allomorphs of marks 𓆎 , 𓆏 , 𓆐 and 𓆑 . Although the piece is not entirely preserved, the order of the marks is similar to that of three ostraca from / attributed to group C. As in ONL 6400, marks 𓆎 and 𓆏 are adjacent in O. WV 4. In the sequence of OL 6788 there is only one mark in between the two. Similarly, mark 𓆐 is only one mark removed from mark 𓆑 in O. Stockholm MM 14130.

Relation to group A:	1 common mark, 4.2%; 3 unattested marks, 12.5% degree of association is 4.2% – 12.5% = -8.3%
Relation to group B:	2 common marks, 5.4%; 2 unattested marks, 5.4% degree of association is 5.4% – 5.4% = 0%
Relation to group C:	4 common marks, 8.2%; 0 unattested marks, 0% degree of association is 8.2% – 0% = 8.2%
Relation to group D:	2 common marks, 6.9%; 2 unattested marks, 6.9% degree of association is 6.9% – 6.9% = 0%

ONL 6444

On account of the resemblance to the sequence of O. Stockholm MM 14130 the marks on the reverse are undoubtedly identifiable as $\text{𓆎} - \text{𓆏} - \text{𓆐} - \text{𓆑}$. With this knowledge it is not farfetched to interpret mark 𓆒 on the reverse as an allomorph of 𓆑 , and 𓆓 as an allomorph of

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Ψ: on ONL 6444 these marks are separated only by ⤴, and on O. Stockholm MM 14130 by mark ⤴. We can safely attribute the ostracon to the latter group on account of the similarities to the sequence of the Stockholm piece, the more so because the degree of association with group C is highest.

Relation to group A:	5 common marks, 20.8%; 3 unattested marks, 12.5% degree of association is 20.8% – 12.5% = 8.3%
Relation to group B:	3 common marks, 8.1%; 5 unattested marks, 13.5% degree of association is 8.1% – 13.5% = -5.4%
Relation to group C:	8 common marks, 16.3%; 0 unattested marks, 0% degree of association is 16.3% – 0% = 16.3%
Relation to group D:	2 common marks, 6.9%; 6 unattested marks, 20.7% degree of association is 6.9% – 20.7% = -13.8%

ONL 6465

The ostracon is inscribed with 16 marks which are scattered over its surface. Yet, rows of marks can to some extent be discerned, and the marks appear to be inscribed in accordance with the sequence of OL 6788 and related ostraca from group C. Right of ⤴ traces of a mark are visible that could well be ⤴ because it is adjacent to mark ⤴. Both marks are situated in positions 5 and 6 on OL 6788. The leftmost mark in the line below it is damaged and cannot be identified. The following marks are Ψ and ⤴, situated in position 12 and 11 on OL 6788. Inscribed below it is mark ⤴, found in position 15. The two circular signs right of it are probably two instances of mark ⊙ (position 19), because right of them follow marks ⤴, ⤴ and ⤴ (positions 17, 18 and 16). Below this row we recognise marks ⤴ and ⤴ (positions 22 and 23), and although mark ⤴ (position 24) is not inscribed immediately next to them, its occurrence on the far right of the ostracon is no coincidence. Left of ⤴ we observe mark ⤴ (position 42) with above it ⤴. The latter mark is not attested on OL 6788, but it is somewhat reminiscent of mark ⤴ (position 41). This mark occurs also as ⤴, and we could explain the relation between this mark and mark ⤴ by interpreting the latter as the hieroglyph for *p* and ⤴ as its hieratic form. ONL 6465 is evidently associated with the ostraca from group C, and is for that reason attributed to the reign of Amenhotep III.

ONL 6544

Three marks are preserved on ONL 6544: ⤴, ⊙ and ⤴. All marks are attested in group C. Both in core ostraca as well as attributed ostraca in this group ⤴ and ⊙ are recorded next to each other. The degree of association is slightly higher for group C than for group A, confirming the suspicion that ONL 6544 belongs to group C.

Relation to group A:	2 common marks, 8.3%; 1 unattested mark, 4.2% degree of association is 8.3% – 4.2% = 4.1%
Relation to group B:	2 common marks, 5.4%; 1 unattested mark, 2.7% degree of association is 5.4% – 2.7% = 2.7%
Relation to group C:	3 common marks, 6.1%; 0 unattested marks, 0% degree of association is 6.1% – 0% = 6.1%
Relation to group D:	2 common marks, 6.9%; 1 unattested mark, 3.5% degree of association is 6.9% – 3.5% = 3.4%

ONL 6600

Six marks are discernable on ONL 6600, which appears to be complete. Marks $\curvearrowright - \uparrow - \star - \Psi$ appear in exactly the same sequence on O. Stockholm MM 14130, attributed to group C. Mark Υ is also attested on that ostracon, while the sixth mark β is found on ostraca from group C as well. ONL 6600 should thus be attributed to the same group, which is also suggested by the high degree of association with group C.

Relation to group A:	1 common mark, 4.2%; 5 unattested marks, 20.8% degree of association is 4.2% – 20.8% = -16.6%
Relation to group B:	3 common marks, 8.1%; 3 unattested marks, 8.1% degree of association is 8.1% – 8.1% = 0%
Relation to group C:	6 common marks, 12.3%; 0 unattested marks, 0% degree of association is 12.3% – 0% = 12.3%
Relation to group D:	3 common marks, 10.4%; 3 unattested marks, 10.4% degree of association is 10.4% – 10.4% = 0%

ONL 6588

Without much effort ONL 6588 is attributed to group C because the order of marks is completely in accord with the sequence of OL 6788: marks \uparrow to \smile correspond to positions 36 to 42. The difference between ONL 6588 and ostraca such as OL 6788, O. Stockholm MM 14130 and O. WV 3 is that mark \uparrow is not repeated. One may speculate that ONL 6588 is therefore somewhat earlier than the other pieces since the workman represented by \uparrow is here still recorded without his presumed son or apprentice.⁴¹

ONL 6634

No more than four marks have been preserved on this ostracon, but we can date it fairly well because the marks appear in the same relative position in the sequence of OL 6788 and associated ostraca. The second mark from the right in the upper line is probably a poorly executed instance of \curvearrowright . On ONL 6634 it is preceded by mark \smile , and both marks are only one mark removed in the sequence of OL 6788. The second line features marks \uparrow and \mathcal{C} , separated by three marks on OL 6788. ONL 6634 is therefore best situated in group C, and this is also suggested by the degree of association, which is highest for this group.

Relation to group A:	1 common mark, 4.1%; 3 unattested marks, 12.5% degree of association is 4.1% – 12.5% = -8.4%
Relation to group B:	1 common mark, 2.7%; 3 unattested marks, 8.1% degree of association is 2.7% – 8.1% = -5.4%
Relation to group C:	4 common marks, 8.2%; 0 unattested marks, 0% degree of association is 8.2% – 0% = 8.2%
Relation to group D:	1 common mark, 3.5%; 3 unattested marks, 10.4% degree of association is 3.5% – 10.4% = -6.9%

ONL 6293

The ostracon is inscribed on two sides, and although the layout of each side is different (two lines with register dividers on the obverse, three or four lines without register dividers on the

⁴¹ For this interpretation, see below, 2.6.3.

reverse), there are no clear indications that the ostrakon was not created by a single scribe.⁴² Several marks on the reverse have faded away and are now illegible, in contrast to the other 28 marks that can be discerned. The damaged mark at the left end of the upper row on the obverse might be mark \ominus or \uparrow , and the third mark from the right in the upper row on the reverse is either Υ or Δ . Almost every mark on ONL 6293 is attested in the sequence of OL 6788, O. Stockholm MM 14130, ONL 6298 etc., suggesting that mark \uparrow is here in all probability an allomorph of mark \dagger . Along the same lines we may assume that mark \uparrow on the reverse is here not an allomorph of Ψ (present on the obverse) but a different mark. Depending on the identification of the uncertain marks, the marks correspond to positions 1-2, 4-6 (when opting for mark \ominus and Δ), 9, 11-12, 14-17, 21, 23-27, 32, 35-37, 39 and 44. Mark \uparrow is not attested on OL 6788, but O. Stockholm MM 14130 and other pieces indicate that it would be situated between positions 23 and 24. The marks on OL 6293 are thus evidently related to OL 6788 and associated ostraca, yet the marks are inscribed in a completely different order. The only exception are the two instances of mark \star , positions 1 and 2, which are inscribed one above the other. Mark δ on the reverse is not attested in any of the four core groups but occurs on O. UC 31988, securely attributed to group C and partly inscribed according to the sequence of OL 6788. Interpreting the uncertain marks as \ominus and Δ , we observe that the degree of association with group C and D are very high. Since ONL 6293 does not include marks that are typical for group D, an attribution to group C seems more likely. That is also suggested by the occurrence of at least eight marks that are not attested in group D.

Relation to group A:	12 common marks, 50.0%; 14 unattested marks, 58.3% degree of association is 50.0% – 58.3% = -8.3%
Relation to group B:	17 common marks, 46.0%; 9 unattested marks, 24.3% degree of association is 46.0% – 24.3 = 21.7%
Relation to group C:	26 common marks, 53.1%; 0 unattested marks, 0% degree of association is 53.1% – 0% = 53.1%
Relation to group D:	18 common marks, 62.1%; 8 unattested marks, 27.6% degree of association is 62.1% – 27.6% = 34.5%

ONL 6266

Although only five marks are identifiable on this small fragment, ONL 6266 is an interesting piece. In the upper line marks Δ and \dagger are visible, which occupy adjacent slots in the sequence of a number of ostraca from group C, such as OL 6788. In the line below we observe mark \curvearrowright , which is not attested in any of the four core groups, but there is a possibility that it is an allomorph of \curvearrowleft . Apart from the fact that the two marks resemble each other, that is suggested by mark Γ , one mark removed from \curvearrowright . In the sequence of OL 6788 marks \curvearrowleft and Γ are situated in slots 39 and 41, indicating that an equation of \curvearrowright with \curvearrowleft would be logical. In between marks \curvearrowright and Γ is the allomorph of mark Υ with a horizontal line below it: Υ . Up to this point we had not paid much attention to this variant. Allomorph Υ is attested on O. MMA 09.184.700 in a slot that is in accordance with the relative position of Υ in the sequence of OL 6788, and on O. WV 10 it is found adjacent to \curvearrowright , reminiscent of slots 14 and 15 in the sequence of OL 6788. On the basis of these observations it would appear that Υ and Υ are interchangeable. However, on ONL 6266, an ostrakon with a series of marks that appears to adhere to the sequence of OL 6788 and similar ostraca, mark Υ is

⁴² Black ink is used on both sides; none of the marks on the obverse occur on the reverse and vice versa; the handwriting seems at a first glance to be consistent.

situated between 𐀓 (slot 39) and 𐀓 (slot 41). If 𐀓 is indeed an allomorph of 𐀓 (slot 14) one would not expect it this close to the end of the sequence. Remarkably, the sequence of ONL 6298, which is related to but in several respects different from the sequence of OL 6788, records mark 𐀓 before 𐀓 and 𐀓 . Mark 𐀓 is certainly to be distinguished from 𐀓 . The latter mark is also attested on ONL 6298, preceding mark 𐀓 as on OL 6788. In analogy with the order $\text{𐀓} - \text{𐀓} - \text{𐀓}$ on ONL 6298, 𐀓 in the sequence $\text{𐀓} - \text{𐀓} - \text{𐀓}$ on ONL 6266 might be – at least on this ostrakon – a different mark from 𐀓 . We can only speculate as to why 𐀓 and 𐀓 do seem to be interchangeable on other ostraca, but a tentative explanation would be that the two marks were used by related workmen, perhaps a father and a son, one of whom would on occasion substitute for and/or eventually replace the other. These conjectures set aside, ONL 6266 is in all probability attributable to group C. That is also suggested by the degree of association with this group.

Relation to group A:	3 common marks, 12.5%; 2 unattested marks, 8.33% degree of association is 12.5% – 8.3% = 4.2%
Relation to group B:	3 common marks, 8.1%; 2 unattested marks, 5.4% degree of association is 8.1% – 5.4% = 2.7%
Relation to group C:	5 common marks, 10.2%; 0 unattested marks, 0% degree of association is 10.2% – 0% = 10.2%
Relation to group D:	2 common marks, 6.9%; 3 unattested marks, 10.4% degree of association is 6.9% – 10.4% = -3.5%

ONL 6272

The 17 preserved marks on this ostrakon are rather crudely executed but can all be identified. The damaged marks situated on the left fracture line are 𐀓 , 𐀓 , 𐀓 and 𐀓 , and the marks on the right edge are 𐀓 (the horizontal variant) and 𐀓 . The dots placed over some the marks render them sometimes difficult to recognise. Without any doubt we still discern 𐀓 above 𐀓 , and 𐀓 above 𐀓 . The marks on ONL 6272 are not inscribed in accordance with a sequence known from other documents. It is however evident that the marks are related to the identity marks recorded on ostraca from group C. Taking OL 6788 as a guideline, we see that marks on OL 6272 originate roughly from the first quarter (positions 3, 7, 8 and 11), the third quarter (positions 20 – 24, 26, 29, 30 and 32) and the fourth quarter (positions 39, 41, 43 and 44). ONL 6272 should therefore date to about the same period as the group C ostraca, which is suggested by the high degree of association with group C as well.

Relation to group A:	2 common marks, 8.3%; 15 unattested marks, 62.5% degree of association is 8.3% – 62.5% = -54.2%
Relation to group B:	8 common marks, 21.6%; 9 unattested marks, 24.3% degree of association is 21.6% – 24.3% = -2.7%
Relation to group C:	17 common marks, 34.7%; 0 unattested marks, 0% degree of association is 34.7% – 0% = 34.7%
Relation to group D:	11 common marks, 37.9%; 6 unattested marks, 20.7% degree of association is 37.9% – 20.7% = 17.2%

ONL 6223

We are able to identify 15 marks on this ostrakon, although it certainly contains more marks. The mark right of 𐀓 seems to be 𐀓 , and the damaged mark right of 𐀓 is probably 𐀓 . Mark 𐀓 is not securely attested on ostraca from the 18th Dynasty, but it is attested as a post-fired mark

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on a pottery fragment from the settlement of huts near the tomb of Amenhotep III (WV 22).⁴³ The marks are not arranged in an order that is attested on other ostraca, but ONL 6223 is certainly attributable to group C. All 14 recognisable marks on ONL 6223 are found in this group and of all groups the degree of association with group C is the highest.

Relation to group A:	4 common marks, 16.7%; 10 unattested marks, 38.5% degree of association is 16.7% – 38.5% = -21.8%
Relation to group B:	8 common marks, 21.6%; 6 unattested marks, 16.2% degree of association is 21.6% – 16.2% = 5.4%
Relation to group C:	14 common marks, 28.6%; 0 unattested marks, 0% degree of association is 28.6 – 0 = 28.6%
Relation to group D:	9 common marks, 31.0%; 5 unattested marks, 17.2% degree of association is 31.0% – 17.2% = 13.8%

ONL 6210

Although the marks on ONL 6210 are written in an attractive hand, damage to the ostrakon hampers its interpretation. No more than 11 marks can be identified, but the document shows traces of additional marks. The marks are not listed in a sequence that is known from other documents. All of the marks on ONL 6210 are attested on ostraca from group C and appear together in the sequence of OL 6788 and similar lists of workmen's marks. The degree of association of ONL 6210 with group D is quite high, but even higher for group C. The ostrakon is for these reasons attributed to the latter group and should date to the reign of Amenhotep III.

Relation to group A:	3 common marks, 12.5%; 8 unattested marks, 33.3% degree of association is 12.5% – 33.3% = -20.8%
Relation to group B:	6 common marks, 16.2%; 5 unattested marks, 13.5% degree of association is 16.2% – 13.5% = 2.7%
Relation to group C:	11 common marks, 22.5%; 0 unattested marks, 0% degree of association is 22.5% – 0% = 22.5%
Relation to group D:	7 common marks, 24.1%; 4 unattested marks, 13.8% degree of association is 24.1% – 13.8% = 10.3%

O. BTdK 833

Although this ostrakon was inscribed with at least nine marks, we can identify only eight of them. They do not feature in a sequence known from other ostraca. One of the marks is the problematic mark 𐀀 , employed as an allomorph for 𐀁 in group B and perhaps D, but not in group C. Because the ostrakon also features mark 𐀂 , attested in group C but not in group B, we may propose to interpret 𐀀 as a different mark from 𐀁 . This would mean that all of the marks on O. BTdK 833 are found on the ostraca from group C. Calculating the degree of association for all four core groups indicates that O. BTdK 833 is closest related to group A and C, but on the basis of the occurrence of marks 𐀂 and 𐀀 the ostrakon should be attributed to the latter group.

⁴³ Yoshimura (ed.), *Research in the Western Valley II*, 97, fig. 53, WV 312. Also attested on ceramic from 18th Dynasty contexts at the village of Deir el-Medina, see Bruyère, *Rapport 1928 II*, 9, fig. 4, nr. 7 (from tomb DM 1149); 129, fig. 69, nr. 12 (from tombs DM 1172 – 1174).

Relation to group A:	5 common marks, 20.8%; 3 unattested marks, 12.5% degree of association is 20.8% – 12.5% = 8.3%
Relation to group B:	5 common marks, 13.5%; 3 unattested marks, 8.1% degree of association is 13.5% – 8.1% = 5.4%
Relation to group C:	8 common marks, 16.3%; 0 unattested marks, 0% degree of association is 16.3% – 0% = 16.3%
Relation to group D:	4 common marks, 13.8%; 4 common marks, 13.8% degree of association is 13.8% – 13.8% = 0%

O. Turin N. 57310

A facsimile of this ostrakon is available,⁴⁴ but personal inspection of the piece indicates that this is not quite accurate. The ostrakon is inscribed with 10 marks, eight of which are fairly well identifiable. All of the marks occur in group C, and O. Turin N. 57310 can be attributed to the same group. Some of the marks are inscribed in accordance with the sequence of ostraca from that group. For instance, adjacent marks $\Gamma\Gamma$ and \times on the lower half of the ostrakon correspond to positions 41 and 43 of the sequence of OL 6788, while mark Σ in the upper line is positioned in slot 44. Right of the latter mark we observe \sqcup and a mark that is probably \sqsupset , found in positions 3 and 4. In the line below marks \top and ϕ are discernable, which are situated next to each other in the sequence of ONL 6298. The mark in the lower left corner is probably \bullet . Besides similarities to the sequence of OL 6788 and ONL 6298 an attribution to group C is suggested by the high degree of association.

Relation to group A:	1 common mark, 4.2%; 6 unattested marks, 25.0% degree of association is 4.2% – 25.0% = -20.8%
Relation to group B:	5 common marks, 13.5%; 2 unattested marks, 5.4% degree of association is 13.5% – 5.4% = 8.1%
Relation to group C:	7 common marks, 14.3%; 0 unattested marks, 0% degree of association is 14.3% – 0% = 14.3%
Relation to group D:	4 common marks, 13.8%; 3 unattested marks, 10.4% degree of association is 13.8% – 10.4% = 3.4%

O. Ashmolean HO 1100

This ostrakon appears to be preserved in its entirety and contains five identity marks. They have not been inscribed in an order that we recognise from other ostraca. All marks are attested in group C, and the degree of association to this group is slightly higher than to group B. It is therefore probably best attributed to the reign of Amenhotep III.

Relation to group A:	1 common mark, 4.2%; 4 unattested marks, 16.7% degree of association is 4.2% – 16.7% = -12.5%
Relation to group B:	4 common marks, 10.8%; 1 unattested mark, 2.7% degree of association is 10.8% – 2.7% = 8.1%
Relation to group C:	5 common marks, 10.2%; 0 unattested marks, 0% degree of association is 10.2% – 0% = 10.2%
Relation to group D:	3 common marks, 10.4%; 2 unattested marks, 6.9% degree of association is 10.4% – 6.9% = 3.5%

⁴⁴ López, *Ostraca Ieratici N. 57093-57319*, pl. 97.

O. KV 10010

The ostrakon is inscribed with nine marks. From left to right we recognise mark \equiv written upside down (probably an allomorph of \equiv), \updownarrow and λ followed by an unclear tall vertical mark, and then marks Γ , \odot , \top , R and Δ . The identification of mark \odot may be disputed. The mark resembles a circle with a traverse horizontal stroke. One would not expect it to be an allomorph of \ominus , the characteristic of which appears to be a horizontal stroke that extends from the outline of the circle. It is probably not an allomorph of \oplus either, of which the crossed lines are the most characteristic element. In favour of interpreting the mark as \odot is the fact that in the sequence of OL 6788 \odot is adjacent to Γ , as on O. KV 10010. The latter mark in turn is one mark removed from λ , which is the case on O. KV 10010 as well. In between λ and Γ OL 6788 lists Υ , which would correspond to our unidentified tall vertical mark. The order of marks on O. KV 10010 thus seems to adhere partly to the sequence of group C. On OL 6788 the marks are situated in positions 35, 27, 16, 17, 18, 19, 26, 24 and 6. This suggests that, despite the provenance of the ostrakon in the valley leading to the tomb of Thutmose III, the ostrakon should be attributed to group C. It dates therefore in the period of Amenhotep III. The attribution is supported by the high degree of association with group C.

Relation to group A:	4 common marks, 16.7%; 5 unattested marks, 20.8% degree of association is 16.7% – 20.8% = -4.1%
Relation to group B:	6 common marks, 16.2%; 3 unattested marks, 8.1% degree of association is 16.2% – 8.1% = 8.1%
Relation to group C:	9 common marks, 18.4%; 0 unattested marks, 0% degree of association is 18.4% – 0% = 18.4%
Relation to group D:	6 common marks, 20.7%; 3 unattested marks, 10.4% degree of association is 20.7% – 10.4% = 10.3%

ONL 6475

Seven marks are discernable on this ostrakon fragment, but one or two marks in the lower right corner cannot be identified securely. No ordered sequence is detectible on the ostrakon, and as a result it is unclear if mark \updownarrow should be interpreted as an allomorph of \dagger or not. Regardless of that question, all marks on ONL 6475 are attested in group C. The degree of association with group C is the highest of all groups, indicating that we are probably correct in attributing ONL 6475 to the same group.

Relation to group A:	2 or 3 common marks, 8.3% or 12.5% 5 or 4 unattested marks, 20.8% or 16.7% degree of association is 8.3% – 20.8% = -12.5% or 12.5% – 16.7% = -4.2%
Relation to group B:	5 common marks, 13.5%; 2 unattested marks, 5.4% degree of association is 13.5% – 5.4% = 8.1%
Relation to group C:	7 common marks, 14.3%; 0 unattested marks, 0% degree of association is 14.3% – 0% = 14.3%
Relation to group D:	4 common marks, 13.8%; 3 unattested marks, 10.4% degree of association is 13.8% – 10.4% = 3.4%

ONL 6499

Damage to this ostrakon hinders us in its interpretation. Recognisable are marks $\Pi\Pi$, H , Δ , \updownarrow and a mark that seems to be R . The latter mark is here interpreted as an allomorph of R . The

marks do not appear in a sequence known from other ostraca. The degree of association with group C is higher than with other groups. The fact that all five marks of ONL 6499 occur in group C supports the idea that the ostrakon is best attributed to this group.

Relation to group A:	3 common marks, 12.5%; 2 unattested marks, 8.3% degree of association is 12.5% – 8.3% = 4.2%
Relation to group B:	3 common marks, 8.1%; 2 unattested marks, 5.4% degree of association is 8.1% – 5.4% = 2.7%
Relation to group C:	5 common marks, 10.2%; 0 unattested marks, 0% degree of association is 10.2% – 0% = 10.2%
Relation to group D:	3 common marks, 10.4%; 2 unattested marks, 6.9% degree of association is 10.4% – 6.9% = 3.5%

ONL 6514

The attestation of mark 𐤀 on this ostrakon is cause for concern, as its interpretation is problematic. Nevertheless, we seem to be able to attribute this ostrakon without much difficulty to group C, because the sequence of marks is very comparable to that of OL 6788. Marks 𐤁 and 𐤂 and marks 𐤃 and 𐤄 have switched positions in ONL 6514, but the marks clearly originate from the first half of the sequence of OL 6788. Yet, without including mark 𐤀 in the comparison, the degree of association is highest for group A. Here we are once again reminded that the calculated degrees of association may only serve as tentative guidelines. Despite the relatively low degree of association to the marks attested in group C, we are probably right in relating ONL 6514 to that very group. That is suggested by the fact that all marks on ONL 6514 are attested in this group, but more so by the sequence of marks that is evidently related to OL 6788.

Relation to group A:	5 common marks, 20.8%; 1 unattested mark, 4.2% degree of association is 20.8% – 4.2% = 16.6%
Relation to group B:	5 common marks, 13.5%; 1 unattested mark, 2.7% degree of association is 13.5% – 2.7% = 10.8%
Relation to group C:	6 common marks, 12.3%; 0 unattested marks, 0% degree of association is 12.3% – 0% = 12.3%
Relation to group D:	3 common marks, 10.4%; 3 unattested marks, 10.4% degree of association is 10.4% – 10.4% = 0%

ONL 6529

The considerable amount of damage to this ostrakon renders it difficult to interpret the document. Marks 𐤀 , 𐤁 , 𐤂 , 𐤃 and 𐤄 are only hesitantly identified. The other traces are unclear. The order of the marks is not related to any of the attested sequences on other ostraca. All five marks are attested in group C. Calculating the degree of association also points out that an attribution to group C is most plausible.

Relation to group A:	2 common marks, 8.3%; 3 unattested marks, 12.5% degree of association is 8.3% – 12.5% = -4.2%
Relation to group B:	3 common marks, 8.1%; 2 unattested marks, 5.4% degree of association is 8.1% – 5.4% = 2.7%

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Relation to group C: 5 common marks, 10.2%; 0 unattested marks, 0%
degree of association is 10.2% – 0% = 10.2%

Relation to group D: 3 common marks, 10.4%; 2 unattested marks, 6.9%
degree of association is 10.4% – 6.9% = 3.5%

ONL 6562

The three marks preserved on this ostrakon are $\overline{\text{d}}$, r and nn . The latter mark is in all probability an allomorph of nn , also attested on O. WV 12. The marks are ordered in accordance with their relative position within the sequence of OL 6788 and associated ostraca. An attribution to group C seems fairly plausible because the degree of association is highest for group C, the order of marks on ONL 6562 is related to group C, as well as the fact that all marks are attested in group C.

Relation to group A: 1 common mark, 4.2%; 2 unattested marks, 8.3%
degree of association is 4.2% – 8.3% = -4.1%

Relation to group B: 1 common mark, 2.7%; 2 unattested marks, 5.4%
degree of association is 2.7% – 5.4% = -2.3%

Relation to group C: 3 common marks, 6.1%; 0 unattested marks, 0%
degree of association is 6.1% – 0% = 6.1%

Relation to group D: 2 common marks, 6.9%; 1 unattested mark, 3.5%
degree of association is 6.9% – 3.5% = 3.4%

ONL 6305

This ostrakon is poorly preserved and several marks are damaged. Although some marks are partially erased, we can identify the marks in the upper row as m , u , r and r . Reading the lines from right to left (and from top to bottom in the case of m and u), the marks appear to have been written in accordance with their relative position within the sequence of ONL 6298, attributed to group C. Indeed all marks on ONL 6305 are attested in group C, and ONL 6305 is attributed to the period without calculating the degrees of association.

ONL 6354

This ostrakon must have been inscribed with at least 15, perhaps 17 marks, but several are incompletely preserved. Two damaged marks written in black ink on the reverse of the ostrakon are probably $\overline{\text{d}}$ and f . This would mean that the latter mark is inscribed twice on ONL 6354. The damaged mark above it is probably r , attested on ONL 6298. Whether the square-shaped sign is here used as a mark is not clear, but because it is attested in group A we will treat it like one. Marks r and r are inscribed next to each other, as are r and u , and f and $\overline{\text{d}}$. They are all found in adjacent positions in the sequence of OL 6788 and associated ostraca as well, which might be indicative of a relation with group C. That is also suggested by the fact that apart from mark (?) \square , all marks on OL 6788 are attested in group C. Indeed, the degree of association is highest for group C. Because of the similarities to the sequence of marks on ostraca from group C and the occurrence of mark r , attested on an ostrakon attributed to this group, ONL 6354 should date to the period of the group C ostraca.

Relation to group A: 5 common marks, 20.8%; 8 unattested marks, 33.3%
degree of association is 20.8% – 33.3% = -12.5%

Relation to group B: 9 common marks, 24.3%; 4 unattested marks, 10.8%
degree of association is 24.3% – 10.8% = 13.5%

Relation to group C:	12 common marks, 24.5%; 1 unattested mark, 2.0% degree of association is 24.5% – 2.0% = 22.5%
Relation to group D:	9 common marks, 31.0%; 4 unattested marks, 13.8% degree of association is 31.0% – 13.8% = 17.2%

ONL 6287

Six marks can be recognised on this fragmentary ostrakon, and they are not arranged in accordance with an attested sequence of marks. Yet, we observe that the marks originate from the beginning and the very end of the sequence: Δ , $\bar{\rho}$, Ψ and λ (positions 6, 10, 12 and 16 on OL 6788) and \times and Σ (positions 43 and 44 on OL 6788). We may therefore expect ONL 6287 to date to the period of the ostraca from group C. That is also suggested by the relatively high degree of association for this group.

Relation to group A:	2 common marks, 8.3%; 4 unattested marks, 16.7% degree of association is 8.3% – 16.7% = -8.4%
Relation to group B:	4 common marks, 10.8%; 2 unattested marks, 5.4% degree of association is 10.8% – 5.4% = 5.4%
Relation to group C:	6 common marks, 12.3%; 0 unattested marks, 0% degree of association is 12.3% – 0% = 12.3%
Relation to group D:	3 common marks, 10.4%; 3 unattested marks, 10.4% degree of association is 10.4% – 10.4% = 0%

ONL 6216

The ostrakon appears to be completely preserved and is inscribed with no other marks than λ , $\bar{\rho}$ and Ψ . The use of red ink and the shape of mark $\bar{\rho}$ reminds one of ONL 6788, but the marks of ONL 6216 are not related to its sequence. We may however be correct in relating ONL 6216 to ONL 6788, attributed to group C, because all of the marks on ONL 6216 are attested in group C. In addition, the degree of association is highest for this group.

Relation to group A:	0 common marks, 0%; 3 unattested marks, 12.5% degree of association is 0% – 12.5% = -12.5%
Relation to group B:	1 common mark, 2.7%; 2 unattested marks, 5.4% degree of association is 2.7% – 5.4% = -2.7%
Relation to group C:	3 common marks, 6.1%; 0 unattested marks, 0% degree of association is 6.1% – 0% = 6.1%
Relation to group D:	1 common mark, 3.5%; 2 unattested marks, 6.9% degree of association is 3.5% – 6.9% = -3.4%

ONL 6203

Three sides of this limestone chunk are inscribed with workmen's marks in a rather haphazardly fashion. Mark Υ occurs on two different sides. The disorganised arrangement of the marks gives the impression that the ostrakon was not created with a particular sequence in mind, but some pairs of marks are recorded in adjacent positions in the sequence of OL 6788: Γ and \circ (positions 18 and 19), \top above ρ (positions 36 and 37), perhaps \sim and $\Gamma\Gamma$ (positions 41 and 42) and to a lesser extent Υ and λ (positions 14 and 16). Since OL 6788 is attributed to group C, we expect ONL 6203 to have been created around the time of Amenhotep III as well. The high degree of association of ONL 6203 with group C agrees with that idea.

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Relation to group A:	11 common marks, 45.8%; 8 unattested marks, 33.3% degree of association is 45.8% – 33.3% = 12.5%
Relation to group B:	11 common marks, 29.7%; 8 unattested marks, 21.6% degree of association is 29.7% – 21.6% = 8.1%
Relation to group C:	18 common marks, 36.7%; 1 unattested mark, 2.0% degree of association is 36.7% – 2.0% = 34.7%
Relation to group D:	10 common marks, 34.5%; 9 unattested marks, 31.0% degree of association is 34.5% – 31.0% = 3.5%

O. KV 10012

Inconveniently this ostrakon is accessible only through a black and white photo of poor quality. The marks with which it is inscribed are not securely identifiable. The leftmost mark in the upper line could be \sqcup followed by \sqsupset as in the sequence of OL 6788. One would then expect the tall vertical sign right of it to be \dagger in accordance with the same sequence, but it rather resembles \uparrow . The next mark could be \uparrow . All four marks are attested in group C, and the possible adherence to the sequence of OL 6788 may be taken as an argument in favour of an attribution of O. KV 10012 to this group. Because the marks are only hesitantly identified, the attribution is unsure.

ONL 6601

Traces of five marks are visible on this limestone ostrakon fragment, but only \times and \circ are identifiable. The mark left of \times could be \uparrow , \uparrow , \uparrow , \uparrow or \uparrow , but it is not attested adjacent to any of these marks in an ordered sequence. On O. WV 8, an ostrakon from group C, \times and \uparrow are adjacent, and this ostrakon also includes \circ . On account of this resemblance, coupled with the observation that \times is only securely attested in group C, ONL 6601 is tentatively attributed to the period of the same group.

ONL 6340

The very small number of marks preserved on this ostrakon makes it difficult to date. To make matters more complicated, the marks do not feature in a sequence known from other ostraca. All three marks are attested in group C, and the degree of association is slightly higher for this group than for others. ONL 6340 is very tentatively attributed to group C.

Relation to group A:	2 common marks, 8.3%; 1 unattested mark, 4.2% degree of association is 8.3% – 4.2% = 4.1%
Relation to group B:	2 common marks, 5.4%; 1 unattested mark, 2.7% degree of association is 5.4% – 2.7% = 2.7%
Relation to group C:	3 common marks, 6.1%; 0 unattested marks, 0% degree of association is 6.1% – 0% = 6.1%
Relation to group D:	2 common marks, 6.9%; 1 unattested mark, 3.5% degree of association is 6.9% – 3.5% = 3.4%

ONL 6423

Marks \dagger , \ddagger and Ψ are well preserved on ONL 6423 but one or two other marks have not survived well enough to be identified. The marks are not evidently part of an ordered sequence, and therefore the ostrakon is difficult to date. The degree of association for group C is slightly higher than for other groups, and the ostrakon is hesitantly ascribed to group C because all marks on ONL 6423 are attested in this set of ostraca.

Relation to group A:	2 common marks, 8.3%; 1 unattested mark, 4.2% degree of association is 8.3% – 4.2% = 4.1%
Relation to group B:	2 common marks, 5.4%; 1 unattested mark, 2.7% degree of association is 5.4% – 2.7% = 2.7%
Relation to group C:	3 common marks, 6.1%; 0 unattested marks, 0% degree of association is 6.1% – 0% = 6.1%
Relation to group D:	1 common mark, 3.5%; 2 unattested marks, 6.9% degree of association is 3.5% – 6.9% = -3.4%

ONL 6260

Three marks are preserved in their entirety on this ostrakon, and traces of two more are visible but indiscernible. As is the case with many other fragmentary ostraca, ONL 6260 is difficult to date. The marks are not ordered in a sequence that is attested on other documents, and there are only small differences in the degrees of association with the four core groups. Because all three marks are attested in group C, ONL 6260 is tentatively dated to the period of this group.

Relation to group A:	2 common marks, 8.3%; 1 unattested mark, 4.2% degree of association is 8.3% – 4.2% = 4.1%
Relation to group B:	1 common mark, 2.7%; 2 unattested marks, 5.4% degree of association is 2.7% – 5.4% = -2.7%
Relation to group C:	3 common marks, 6.1%; 0 unattested marks, 0% degree of association is 6.1% – 0% = 6.1%
Relation to group D:	2 common marks, 6.9%; 1 unattested mark, 3.5% degree of association is 6.9% – 3.5% = 3.4%

ONL 6348

The first mark from the right on the obverse of fragmentary ostrakon ONL 6348 is unclear, but might be 𓆎 . Mark Δ on the reverse is probably an allomorph of mark Δ . The mark is inscribed next to 𓆎 , the problematic mark that can be interpreted as an allomorph of Ψ depending on the date of the ostrakon. The occurrence of mark 𓆎 on the obverse, not attested in groups A and B, suggest that mark is here used not as an allomorph but as a mark of its own. To the best of our knowledge the marks of ONL 6348 do not feature in a meaningful sequence. The ostrakon is tentatively attributed to group C and probably dates to the reign of Amenhotep III. All marks on ONL 6348 are attested in group C, and the degree of association to group C is highest of all groups.

Relation to group A:	2 common marks, 8.3%; 3 unattested marks, 12.5% degree of association is 8.3% – 12.5% = -4.2%
Relation to group B:	3 common marks, 8.1%; 2 unattested marks, 5.4% degree of association is 8.1% – 5.4% = 2.7%
Relation to group C:	5 common marks, 10.2%; 0 unattested marks, 0% degree of association is 10.2% – 0% = 10.2%
Relation to group D:	3 common marks, 10.4%; 2 unattested marks, 6.9% degree of association is 10.4% – 6.9% = 3.5%

ONL 6565

Although four marks are visible on this ostrakon, only three can be identified: \mathcal{A} , \dagger and Ψ . The marks are not positioned in accordance with a known sequence, which makes it difficult to accurately date this small group of marks. Mark \mathcal{A} is only attested in group C, the group with the highest degree of association. ONL 6565 is on these grounds cautiously attributed to group C.

Relation to group A:	1 common mark, 4.2%; 2 unattested marks, 8.3% degree of association 4.2% – 8.3% = -4.1%
Relation to group B:	1 common mark, 2.7%; 2 unattested marks, 5.4% degree of association is 2.7% – 5.4% = -2.7%
Relation to group C:	3 common marks, 6.1%; 0 unattested marks, 0% degree of association is 6.1% – 0% = 6.1%
Relation to group D:	1 common mark, 3.5%; 2 unattested marks, 6.9% degree of association is 3.5% – 6.9% = -3.4%

ONL 6580

This ostrakon probably dates to the 18th Dynasty because mark \overline{m} , attested in group C, is clearly recognisable. All other marks and signs however are very puzzling. Discernable is mark \uparrow , and left of it perhaps \uparrow adjacent to a tall vertical stroke of unclear meaning. A mark in the left lower corner is damaged and unidentifiable. The square with dot inside it situated below \overline{m} is not attested as a mark, and what it signifies is inexplicable. It is similarly unclear if the horizontal stroke and dot left of it represent mark \mathcal{A} or not. ONL 6580 is with much reservations attributed to group C because the more or less securely identified marks are attested in this group.

ONL 6646

The only marks that are preserved on ONL 6646 are β and \mathcal{A} . Calculating degrees of association is pointless in this case, because mark \mathcal{A} is attested in all four core groups and mark β is only known from ostraca in group C. The two marks are attested together in two ostraca from group C: O. WV 3 and attributed ostrakon OL 6788. They are, however, not found in adjacent positions as on ONL 6646. The attribution of this ostrakon to group C remains therefore tentative.

ONL 6692

The marks on this ostrakon are only faintly visible and might have been erased by the scribe. Marks Υ and Ψ can be discerned without too much trouble, and a third mark may be \mathcal{M} , but the other traces are illegible. Each mark is inscribed in the cell of a large table comparable to the one we have seen on ONL 6634. We had attributed the latter ostrakon to group C, and if this particular format is any indication of a date, ONL 6692 might have been created around the same period. The three marks on ONL 6692 are not ordered in accordance with a sequence attested elsewhere. The ostrakon is tentatively attributed to group C on account of its layout and the fact that all three marks are attested in this group. This attribution is supported by the degree of association with group C.

Relation to group A:	0 common marks, 0%; 3 unattested marks, 12.5% degree of association is 0% – 12.5% = -12.5%
Relation to group B:	2 common marks, 5.4%; 1 unattested mark, 2.7% degree of association is 5.4% – 2.7% = -2.7%

Relation to group C: 3 common marks, 6.1%; 0 unattested marks, 0%
degree of association is 6.1% – 0% = 6.1%

Relation to group D: 2 common marks, 6.9%; 1 unattested mark, 3.5%
degree of association is 6.9% – 3.5% = 3.4%

ONL 6579

Mark $\hat{\text{r}}$ is quite rare in the 18th Dynasty, but it is attested together with mark r on ONL 6410 and ONL 6372. It is also present on ONL 6564, but there without mark r . In analogy with ONL 6410, ONL 6579 is attributed to group C, if only tentatively.

ONL 6564

Only three marks are visible on this ostrakon: \square , only attested in group A; f , attested in all four groups; and $\hat{\text{r}}$, only found on ostraca attributed to group C. The ostrakon is thus difficult to date. On account of the latter mark, it is tentatively attributed to group C.

2.2.10 Ostraca attributed to group D

A total of nine ostraca are attributed to group D. As explained above, this group is situated between groups B and C. Ostraca from this group should therefore date to the period between the reign of Amenhotep II and Amenhotep III.

O. Cairo JE 96603

The lower edge of the ostrakon appears to be damaged because the marks on the edge are not fully preserved. The ostrakon seems to have been divided into three separate sections. Some marks are inscribed more than once in different sections. The ostrakon probably displays 22 different marks, but this is not entirely certain: are mark ~~⌘~~ and the three instances of mark H on this ostrakon different forms of the same mark? Other than its orientation ~~⌘~~ the shape of the mark is not dissimilar from H , and it is therefore interpreted as an allomorph. The faintly visible mark \square could here be an allomorph of \square , and that possibility is considered here. It is otherwise attested on O. MMA 09.184.770, attributed to group B. The mark H on O. Cairo JE 96603 is not seen as an allomorph of \square because it is distinctly different, closely resembling hieroglyphic sign mn . The mark r is somewhat similar to r and could be an allomorph of it.⁴⁵

Comparing the marks on O. Cairo JE 96603 to the ostraca in groups A, B, C and D, we see that O , Δ , Y , r and H occur in all four groups; mark v is attested in groups A, C and D; marks f , w , T and ~~⌘~~ are found in groups B, C and D; mark l is found in groups A and B; marks r , f , d , m and Y are found in groups C and D; if mark \square indeed is an allomorph of u , it is attested only in group C; and marks $\Delta\Delta$ and H are attested in group D only. Marks H and r are not found in any of the four core groups. The marks on O. Cairo JE 96603 are strongly related to group D:

Relation to group A: 7 common marks, 29.2%; 15 unattested marks, 62.5%
degree of association is 29.2% – 62.5% = -33.3%

Relation to group B: 10 common marks, 27.0%; 12 unattested marks, 32.4%
degree of association is 27.0% – 32.4% = -5.4%

Relation to group C: 15 or 16 common marks, 30.6% or 32.7%
 7 or 6 unattested marks, 14.3% or 12.3%
degree of association is 30.6% – 14.3% = 16.3%

⁴⁵ See also ONL 6416 below, p. 124.

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or $32.7\% - 12.3\% = 20.4\%$

Relation to group D: 17 common marks, 58.6%; 5 unattested marks, 17.2%
degree of association is $58.6\% - 17.2\% = 41.4\%$

Both in absolute numbers and in terms of degrees of association the marks on O. Cairo JE 96603 fit best in groups D. The fact that the ostrakon displays \perp , a mark which is present in groups A and B but not in group C, but also contains a number of marks which are present in group C but not in groups A and B, supports the attribution of O. Cairo JE 96603 to position between group B and C. An attribution to group D is also suggested by the two marks that are not attested in any other core group than group D ($\Delta\Delta$ and 𐀓) versus only one mark which is (perhaps!) attested exclusively in group C (𐀓). The marks on O. Cairo JE 96603 do not appear in a sequence that is known from other ostraca, which is yet another aspect that O. Cairo JE 96603 has in common with the ostraca in group D.

O. Cairo JE 96590

The ostrakon is completely preserved and all marks are well recognisable. The ostrakon contains 19 marks, but one mark is repeated. Marks 𐀓 , 𐀔 , 𐀕 and 𐀖 are found in group A, B, C and D; mark 𐀗 is found in groups A, B and C; mark 𐀘 is found in groups A, B and D; marks 𐀙 , 𐀚 and 𐀛 are found in groups B, C and D; mark 𐀜 is attested in group A and D; marks 𐀝 and 𐀞 are found in groups B and C; mark 𐀟 is attested in groups B and D; marks 𐀠 , 𐀡 and 𐀢 are found in groups C and D; mark 𐀣 could well be the same mark as the damaged mark 𐀤 in group C (O. WV 2); finally, mark 𐀥 is not attested in any of the core groups. The marks on O. Cairo JE 96590 are closest related to groups B, C and D:

Relation to group A: 7 common marks, 29.2%; 11 unattested marks, 45.8%
degree of association is $29.2\% - 45.8\% = -16.6\%$

Relation to group B: 12 common marks, 32.4%; 6 unattested marks, 16.2%
degree of association is $32.4\% - 16.2\% = 16.2\%$

Relation to group C: 13 or 14 common marks, 26.5% or 28.6%
 5 or 4 unattested marks, 10.2% or 8.2%
degree of association is $26.5\% - 10.2\% = 16.3\%$
or $28.6\% - 8.2\% = 20.4\%$

Relation to group D: 12 common marks, 41.4%; 6 unattested marks, 20.7%
degree of association is $41.4\% - 20.7\% = 20.7\%$

In absolute numbers, more marks on O. Cairo JE 96590 are attested in group C than in any other group. Yet when the degrees of association are calculated, the marks on O. Cairo JE 96590 are strongest related to group D.⁴⁶ The marks on O. Cairo JE 96590 are not inscribed in a sequence that is known from other ostraca. Although the marks are inscribed in three distinct lines, the lines are far from perfectly horizontal. It is the shape of the ostrakon that dictates the inclination of the lines: the first line is more or less horizontal because the upper edge of the ostrakon is horizontal. Yet, the second line declines from mark 𐀕 onwards, because the edge of the ostrakon does too. This layout, where the shape of the ostrakon determines the arrangement of the marks, is a characteristic of group D.⁴⁷ The layout of the ostrakon, the fact that the ostrakon does not display a sequence of marks found in group C,

⁴⁶ See above, 2.2.4.

⁴⁷ See above, 2.2.4.

and the high degree of relatedness to group D argue in favour of an attribution of O. Cairo JE 96590 to group D.

O. Cairo JE 96591

The ostrakon is most likely completely preserved and displays six marks. Marks Σ and \mathbb{H} are found in groups A, B, C and D; mark \uparrow is attested in groups B, C and D; mark \mathfrak{F} is attested in groups B and C; mark \mathfrak{H} is found in groups C and D; and mark \mathfrak{K} is found in group D only. On the basis of the calculated degrees of association, the marks on O. Cairo JE 96591 are closest related to group D:

Relation to group A:	2 common marks, 8.3%; 4 unattested marks, 16.7% degree of association is 8.3% – 16.7% = -8.4%
Relation to group B:	4 common marks, 10.8%; 2 unattested marks, 5.4% degree of association is 10.8% – 5.4% = 5.4%
Relation to group C:	5 common marks, 10.2%; 1 unattested mark, 2.4% degree of association is 10.2% – 2.4% = 7.8%
Relation to group D:	5 common marks, 17.2%; 1 unattested mark, 3.5% degree of association is 17.2 – 3.5% = 13.7%

Clearly, the marks in O. Cairo JE 96591 are related to groups B, C and D. The fact that mark \mathfrak{K} is found in no other core group than group D makes an attribution of O. Cairo JE 96591 to that particular group plausible. The marks on O. Cairo JE 96591 are neatly arranged in a horizontal line. In the sequence of group B marks \mathfrak{D} and \uparrow are found next to each other, as in O. Cairo JE 96591. Moreover, the situation of \mathfrak{H} next to \mathbb{H} on O. Cairo JE 96591 resembles the sequence $\mathfrak{H} - \mathfrak{K} - [\mathbb{H}]$ on O. Stockholm MM 14130 (restoring \mathbb{H} after \mathfrak{K} cf. the sequence of OL 6788). Yet, the marks of O. Cairo JE 96591 are not inscribed in a longer sequence that is known from other ostraca.

On the basis of this fact, the high degree of association to group D, and the occurrence of mark \mathfrak{K} , O. Cairo JE 96591 is attributed to the same group. Within group D, it should be situated closer to group C than to group B, because of the high number of marks that occur in group C as well.

O. Cairo JE 72450

This ostrakon is not completely preserved and it displays some fragmentary marks. Mark \mathfrak{L} is damaged and not securely identified as a mark known from other ostraca. It is unclear whether \mathfrak{L} is incomplete or not. If it is incomplete, it is not attested on any other ostrakon. If it is, there is a possibility that this mark is \mathfrak{L} . The mark next to \uparrow might be \mathfrak{K} or \mathfrak{L} , but that is uncertain. Mark \uparrow is found in groups A, B, C and D; mark \mathfrak{L} is found in group B and D; marks \mathfrak{H} , \mathfrak{D} and \mathfrak{M} are attested in groups C and D; mark \mathfrak{A} is attested in group A only; and mark $\Delta\Delta$ is found in group D only; if the damaged mark at the left end of the ostrakon is indeed either \mathfrak{K} or \mathfrak{L} , it is found in groups B, C and D; and if \mathfrak{L} indeed is \mathfrak{L} , it is found in group C only. The small number of marks on O. Cairo JE 72450 and the uncertain identification of three of them make it difficult to analyse the relation between its marks and the marks on the ostraca in the core groups A, B, C and D. Both in absolute numbers and in calculated degrees of association the marks on O. Cairo JE 72450 are closest related to the marks in group D.

Relation to group A:	2 common marks, 8.3%; 7 unattested marks, 29.2% degree of association is 8.3% – 29.2% = -20.9%
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2. OSTRACA WITH MARKS OF THE 18TH DYNASTY

Relation to group B:	2 or 3 common marks, 5.4% or 8.1% 7 or 6 unattested marks, 18.9% or 16.2% degree of association is 5.4% – 18.9% = -13.5% or 8.1% – 16.2% = -8.1%
Relation to group C:	4 or 6 common marks, 8.2% or 12.3% 5 or 3 unattested marks, 10.2% or 6.1% degree of association is 8.2% – 10.2% = -2.0% or 12.3% – 6.1% = 6.2%
Relation to group D:	6 or 7 common marks, 20.7% or 24.1% 3 or 2 unattested marks, 10.3% or 6.9% degree of association is 20.7% – 10.3% = 10.4% or 24.1% – 6.9% = 17.2%

The ostrakon does not display a sequence of marks known from other ostraca. The occurrence of mark \aleph (only found in group A), mark \beth (only found in groups B and D) and of mark $\Delta\Delta$ (only found in group D) argue against an attribution to group C, the group with which O. Cairo JE 72450 shares almost as many marks as with group D. One ostrakon in core group D, O. Cairo JE 96331, shows \aleph next to \beth , which in turn is situated above the mark $\Delta\Delta$. This mark is found right of \beth on O. Cairo JE 72450, which itself could be preceded by \aleph , but that is very uncertain. O. Cairo JE 72450 is thus tentatively attributed to group D. Because of the occurrence of marks \aleph and \beth , O. Cairo JE 72450 should be situated closer to groups A and B than to group C.

ONL 6339

Four out of the five marks can be identified. Although it is doubtful if the marks on O. Cairo JE 96603 are inscribed according to a meaningful sequence, it is interesting that the order of marks $\Delta - \beth - \Delta\Delta$ is similar to the order on ONL 6339, which displays $\beth - \beth - \Delta - \Delta\Delta$. Since O. Cairo JE 96603 is associated with group D, we expect ONL 6339 to date to the same period. This is also suggested by the degree of association that is highest for group D. For this reason ONL 6339 is attributed to group D.

Relation to group A:	1 common mark, 4.2%; 3 unattested marks, 12.5% degree of association is 4.2% – 12.5% = -8.3%
Relation to group B:	2 common marks, 5.4%; 2 unattested marks, 5.4% degree of association is 5.4% – 5.4% = 0%
Relation to group C:	3 common marks, 6.1%; 1 unattested mark, 2.0% degree of association is 6.1% – 2.0% = 4.1%
Relation to group D:	3 common marks, 10.4%; 1 unattested mark, 3.5% degree of association is 10.4% – 3.5% = 6.9%

ONL 6789

Apart from one damaged mark on the right edge of the ostrakon, all marks of ONL 6789 are well identifiable. The marks do not feature in exactly this sequence on other ostraca, but those marks that are attested on ONL 6788 do appear in the relative position they occupy within the sequence of that document. Yet, marks \beth and $\Delta\Delta$ are adjacent on O. Cairo JE 96603, an ostrakon attributed to group D. The relation between ONL 6789 and group D is very strong, as indicated by the high degree of association with this group. Coupled with the fact that marks $\Delta\Delta$ and \beth are only attested on ostraca in group D, ONL 6789 is best assigned to this group and should thus date between the reign of Amenhotep II and Amenhotep III.

Relation to group A:	2 common marks, 8.3%; 6 unattested marks, 25.0% degree of association is 8.3% – 25.0% = -16.7%
Relation to group B:	3 common marks, 8.1%; 5 unattested marks, 13.5% degree of association is 8.1% – 13.5% = -5.4%
Relation to group C:	6 common marks, 12.3%; 2 unattested marks, 4.1% degree of association is 12.3% – 4.1% = 8.2%
Relation to group D:	6 common marks, 20.7%; 2 unattested marks, 6.9% degree of association is 20.7% – 6.9% = 13.8%

ONL 6214

This ostrakon, inscribed on obverse and reverse, is not completely preserved. Mark \square is attested on both sides. The marks are not ordered in a sequence that is attested on other documents, but the occurrence of marks ⸙ and $\Delta\Delta$, only found on ostraca that constitute group D, are indicative of its date. An ascription to group D is also suggested by the degree of association with group D. Mark \square is only securely attested in group C, but it is also found on O. Cairo JE 96590, associated with group D, and is further evidence for the attribution of ONL 6214 to the latter set of ostraca.

Relation to group A:	0 common marks, 0%; 6 unattested marks, 25.0% degree of association is 0% – 25.0% = -25.0%
Relation to group B:	1 common mark, 2.7%; 5 unattested marks, 13.5% degree of association is 2.7% – 13.5% = -10.8%
Relation to group C:	4 common marks, 8.2%; 2 unattested marks, 4.1% degree of association is 8.2% – 4.1% = 4.1%
Relation to group D:	4 common marks, 13.8%; 2 unattested marks, 6.9% degree of association is 13.8% – 6.9% = 6.9%

ONL 6346

Three marks can be discerned on this much faded ostrakon, and traces of a fourth unidentifiable mark are visible to the left. The three marks \square , ⸙ and ⸙ are not found in this order on other ostraca. The degree of association with group A is relatively high for ONL 6346, but such a date seems unlikely because of the occurrence of mark ⸙ , only securely attested in group D. The degree of association with group D is only slightly lower than for group A, and an attribution to this group seems more plausible. That is suggested by the fact that mark \square , not attested on the key ostraca that constitute group D, is found on O. Cairo JE 96590, which evidently belongs to that group as well.

Relation to group A:	2 common marks, 8.3%; 1 unattested mark, 4.2% degree of association is 8.3% – 4.2% = 4.1%
Relation to group B:	1 common mark, 2.7%; 2 unattested marks, 5.4% degree of association is 2.7% – 5.4% = -2.7%
Relation to group C:	2 common marks, 4.1%; 1 unattested mark, 2.0% degree of association is 4.1% – 2.0% = 2.1%
Relation to group D:	2 common marks, 6.9%; 1 unattested mark, 3.5% degree of association is 6.9% – 3.5% = 3.4%

ONL 6416

The damaged mark right of \sqcap might be \uparrow in analogy with O. WV 2 but that cannot be verified. We are therefore obliged to leave it out of our comparison. Mark \uparrow left of \wp is not attested in this shape on other ostraca, but it closely resembles \uparrow and \uparrow , suggesting that both marks may be abstract representations of some sort of mammal.⁴⁸ This is also a strong indication that marks \uparrow and \uparrow are in fact allomorphs of the same mark. Indeed, mark \uparrow is situated adjacent to \wp on ONL 6416, just like \uparrow on O. WV 13 and O. Stockholm MM 14130, and \uparrow on OL 6788 and ONL 6298. ONL 6416 also displays mark \uparrow , which is often difficult to interpret. This ostrakon however seems to be closer related to groups C and D than to B, and therefore we can take \uparrow as an autonomous mark. That is suggested by the calculated degrees of association, which is highest for groups C and D. Even though marks \sqcap and \uparrow are not attested on the ostraca that constitute group D, we may hesitantly attribute ONL 6416 to this group because these marks are found on O. Cairo JE 96590 and O. Cairo JE 96603, attributed to group D.

Relation to group A:	2 common marks, 8.3%; 5 unattested marks, 20.8% degree of association is 8.3% – 20.8% = -12.5%
Relation to group B:	4 common marks, 10.8%; 3 unattested marks, 8.1% degree of association is 10.8% – 8.1% = 2.7%
Relation to group C:	6 common marks, 12.3%; 1 unattested mark, 2.0% degree of association is 12.3% – 2.0% = 10.3%
Relation to group D:	5 common marks, 17.2%; 2 unattested marks, 6.9% degree of association is 17.2% – 6.9% = 10.3%

2.2.11 Ostraca attributed to groups B and D

In five instances it is not evident if the ostrakon is better attributed to group B or group D. They may date somewhere in the reign of Amenhotep II, but a later date, perhaps in the reign of Thutmose IV is also plausible.

ONL 6365

Seven marks are visible on ONL 6365, but they are not all well preserved. The mark in the lower line is damaged and hesitantly identified as \uparrow . Traces of the second mark from the right in the upper line appear to belong to mark \boxtimes , but this mark is also inscribed two marks down the very same line. Yet this should not be a problem, because we have seen similar instances of a double mark on other ostraca. ONL 6365 does not display a sequence of marks that is found elsewhere, which makes it difficult to date. The degree of association with groups B and C (0%) is higher than both other groups. Yet, ONL 6365 displays marks \wp and \uparrow that are attested in group B exclusively. Similarly, mark \uparrow is found only in group D. These marks are suggestive of a date earlier than group C, and the ostrakon is for that reason attributed to the period between group B and D.

Relation to group A:	2 common marks, 8.3%; 4 unattested marks, 16.7% degree of association is 8.3% – 16.7% = -8.4%
Relation to group B:	3 common marks, 8.1%; 3 unattested marks, 8.1% degree of association is 8.1% – 8.1% = 0%

⁴⁸ This observation lends more credence to the idea that mark \uparrow on O. Cairo JE 96603 is an allomorph of \uparrow . It may in fact be the same mark as on ONL 6416.

Relation to group C:	3 common marks, 6.1%; 3 common marks, 6.1% degree of association is 6.1% – 6.1% = 0%
Relation to group D:	2 common marks, 6.9%; 4 unattested marks, 13.8% degree of association is 6.9% – 13.8% = -6.9%

O. MMA 09.184.786

Nine marks are well preserved on this ostrakon and a 10th mark is too damaged to identify. The remaining marks are, from right to left, ⤴, ⤵, ⊥, ⤶, ⤷, ⤸, ⤹, ⤺ and ⤻. The occurrence of mark ⤶ would suggest that the ostrakon is related to group D, and with six common marks the degree of association with group D is higher than for other groups. Yet, O. MMA 09.184.786 displays six marks that are attested in group B, and particularly mark ⤺, found in groups A and B exclusively, is suggestive of an earlier date. Reading the ostrakon from right to left we notice that the marks that also appear on O. Cairo CG 24105, one of the key ostraca of group B, correspond to their relative position within the sequence of the latter document: 2, (-), 8, (-), (-), 9, 12, 16, and 18. Obviously the order of marks is not the same, and it appears that on O. MMA 09.184.786 the sequence has been augmented with marks that were not yet in use during the period of the group B ostraca, such as ⤶ and ⤵. These marks are not attested in group A either, which suggests that MMA 09.184.786 should be of a later date than the group B ostraca. Since the ostrakon does partly follow the sequence of two ostraca from group B it cannot date to far from it, and it is therefore attributed to the period between group B and D.

Relation to group A:	4 common marks, 16.7%; 5 unattested marks, 20.8% degree of association is 16.7% – 20.8% = -4.1%
Relation to group B:	6 common marks, 16.2%; 3 unattested marks, 5.4% degree of association is 16.2% – 5.4% = 10.8%
Relation to group C:	7 common marks, 14.3%; 2 unattested marks, 4.1% degree of association is 14.3% – 4.1% = 10.2%
Relation to group D:	6 common marks, 20.7%; 3 unattested marks, 10.4% degree of association is 20.7% – 10.4% = 10.3%

O. Parker H 7

This ostrakon is incompletely preserved and features six marks: ⤴, ⤵, ⤶, ⤷, ⤸ and ⤹. Mark ⤹ is only securely attested in group D. The other five marks are all attested in group B. In the sequence of O. Cairo CG 24107 marks ⤴, ⤵, ⤶ and ⤷ correspond to slots 15, 5, 21 and 26, while in O. Cairo CG 24105 marks ⤴, ⤵, ⤷ and ⤸ correspond to slots 14, 5, 24 and 26. With the exception of mark ⤴, the marks on O. Parker H 7 thus seem to be listed to a limited extent in accordance with the sequence of two of the key ostraca of group B. This does not necessarily mean that O. Parker H 7 should be attributed to that group. As indicated by the high degree of association, the relation to group D is strong as well. It seems therefore likely that the ostrakon dates to the period between the core groups B and D.

Relation with group A:	3 common marks, 12.5%; 3 unattested marks, 12.5% degree of association is 12.5% – 12.5% = 0%
Relation with group B:	5 common marks, 13.5%; 1 unattested mark, 2.7% degree of association is 13.5% – 2.7% = 10.8%
Relation with group C:	2 common marks, 4.1%; 4 unattested marks, 8.2% degree of association is 4.1% – 8.2% = -4.1%

2. OSTRACA WITH MARKS OF THE 18TH DYNASTY

Relation with group D: 5 common marks, 17.2%; 1 unattested mark, 3.5%
degree of association is 17.2% – 3.5% = 13.7%

O. Ashmolean HO 892

It is unfortunate that this ostrakon is not preserved in its entirety because it contains a long sequence of marks written in a neat hand. All 19 marks can be discerned without much trouble. We observe the double instance of mark ⲟ . Unattested in our core ostraca is mark ⲟ , written upside down on this piece. A similar mark is attested on O. UC 31988, attributed to group C and discussed below. On that ostrakon the mark may perhaps be an allomorph of ⲟ , but it is not clear if ⲟ on O. Ashmolean HO 892 can be interpreted in the same way. As a consequence we have to omit the mark from our comparison. Two other marks on O. Ashmolean HO 892 are notable: ⲙ , only securely attested in group D, and ⲗ , in the core ostraca exclusively found in group C. The latter mark is however also present on ostraca that we have attributed to group B (O. KV 10004, O. MMA 09.184.770 and O. UC 45708). One of these ostraca, O. KV 10004 has 10 marks in common with the 18 marks of O. Ashmolean HO 892, and may therefore date to approximately the same period. This would suggest that O. Ashmolean HO 892 is to be attributed to group B, and the high degree of association with that group stands in support of this view. The degree of association with group D is however quite high too, and mark ⲙ is indicative of an attribution to that group. On the other hand we have observed that this mark ⲙ is also found on ostraca that may antedate the group D ostraca (O. Brock 27 and ONL 6365). Some evidence for a closer connection with the group B ostraca is provided by the sequence of the marks on O. Cairo CG 24105. Four marks on O. Ashmolean HO 298 are inscribed in accordance with their relative position within that particular sequence:

O. Cairo CG 24105	ⲟ	...	ⲟ	ⲙ	ⲗ	ⲟ	ⲗ
O. Ashmolean HO 298	ⲟ	ⲟ	ⲙ	ⲗ	ⲟ	ⲗ	

If we assume that this is not a coincidence, then O. Ashmolean HO 298 is best attributed to group B. Yet it is clear that the ostrakon is also strongly related to the ostraca in group D. It is therefore ascribed to both groups, and could date to the end of the reign of Amenhotep II or perhaps the reign of Thutmose IV.

Relation to group A: 6 common marks, 25.0%; 11 unattested marks, 45.8%
degree of association is 25.0% – 45.8% = -20.8%

Relation to group B: 13 common marks, 35.1%; 4 unattested marks, 10.8%
degree of association is 35.1% – 10.8% = 24.3%

Relation to group C: 13 common marks, 26.5%; 4 unattested marks, 8.2%
degree of association is 26.5% – 8.2% = 18.3%

Relation to group D: 11 common marks, 37.9%; 6 unattested marks, 20.7%
degree of association is 37.9% – 20.7% = 17.2%

O. Brock 27

The interpretation of this ostrakon is much hindered by the fact that the upper half of this ostrakon is lost. It is inscribed with at least 17 different marks, four of which cannot be identified. The marks are not ordered in a sequence that is known from other ostraca. The damaged mark below ⲟ is perhaps ⲙ , and the mark right of ⲗ could either be ⲟ , attested on O. Cairo JE 72490, or ⲗ in analogy with O. MMA 09.184.770. The rightmost mark on the same side of the ostrakon resembles ⲟ , but the two marks to its left are not attested elsewhere

and cannot be identified. It is uncertain if they are to be taken as marks. Because we are not sure about these two marks and mark \square or \sqcap , we will omit them from an initial calculation of the degrees of association. The calculation demonstrates that marks on the ostracon are predominantly related to groups B and D. An attribution to the latter two groups is suggested by the occurrence of \parallel (only securely attested in group B) and of 𐀓 only securely attested in group D). Yet, taking into account the possible presence of \square or \sqcap , a date prior to group D is plausible because the former mark is attested in group A and the latter is found on O. MMA 09.184.770 attributed to group B. The ostracon is for that reason tentatively attributed to group B, but a slightly later date near the ostraca of group D remains plausible as well.

Relation to group A:	6 common marks, 25.0%; 4 unattested marks, 16.7% degree of association is 25.0% – 16.7% = 8.3%
Relation to group B:	9 common marks, 24.3%; 1 unattested mark, 2.7% degree of association is 24.3% – 2.7% = 21.6%
Relation to group C:	6 common marks, 12.3%; 4 unattested marks, 8.2% degree of association is 12.3% – 8.2% = 4.1%
Relation to group D:	8 common marks, 27.6%; 2 unattested marks, 6.9% degree of association is 27.6% – 6.9% = 20.7%

2.2.12 Ostraca attributed to groups D and C

There are 13 ostraca that are strongly related to the ostraca in group D and group C, but cannot be assigned to one of them specifically. In some instances a date between these two groups seems most plausible. We may expect these ostraca to date to the reign of Thutmose IV or the first half of the reign of Amenhotep III.

ONL 6509

Two marks on ONL 6509 require some discussion. We had seen that in group B mark 𐀗 occurs in one instance as an allomorph of flower-shaped mark 𐀙 , and that possibility should be considered for this mark on ONL 6509 as well. The rightmost mark in the upper line is damaged and therefore it is unclear whether we are dealing with mark 𐀚 or mark 𐀛 . Despite this ambiguity, all marks in the upper line are situated in the first part of the sequence of OL 6788. Depending on their interpretation, they are situated in positions 9 or 12, 7, 3, and 8 or 14. Marks 𐀜 and 𐀝 are quite far apart on OL 6788, but in the sequence of related ostracon ONL 6298, there is but a single mark between them. Since we are not quite sure about the exact shape of the rightmost mark in the upper line, we will leave it out of our comparison. As the sequence of marks indicates, ONL 6509 is probably related to group C. Indeed, the degree of association with this group is considerable. The degree of association is however almost as high for group D. Because of the fact that all identifiable marks on ONL 6509 are attested in group C as well as the fact that the order of marks is reminiscent of that of OL 6788, an attribution to group C is slightly more plausible.

Relation to group A:	0 common marks, 0%; 5 unattested marks, 20.8% degree of association is 0% – 20.8% = -20.8%
Relation to group B:	3 common marks, 8.1%; 2 unattested marks, 5.4% degree of association is 8.1% – 5.4% = 2.7%
Relation to group C:	5 common marks, 10.2%; 0 unattested marks, 0% degree of association is 10.2% – 0% = 10.2%

2. OSTRACA WITH MARKS OF THE 18TH DYNASTY

Relation to group D: 4 common marks, 13.8%; 1 unattested mark, 3.5%
degree of association is 13.8% – 3.5% = 10.3%

ONL 6415

The surface of this fragmentary ostrakon is crammed with numerous crudely drawn marks that are extremely difficult to identify. They are evidently not listed in accordance with a sequence that is attested elsewhere. It is with the greatest hesitation that we can make out marks Υ , Υ , \sim , λ , \triangle , \ddagger and λ . The latter mark must be an allomorph of \ddagger , attested in group D. The identified marks do not unequivocally point towards a specific date. Mark λ is only securely attested in group A, but occurs also on O. Cairo JE 72450, attributed to group D. Marks λ and \ddagger are also suggestive of a date after the period of Amenhotep II. Despite the high degree of association with group A, ONL 6415 is here attributed to groups D and C.

Relation to group A: 5 common marks, 20.8%; 3 unattested marks, 12.5%
degree of association is 20.8% – 12.5% = 8.3%

Relation to group B: 4 common marks, 10.8%; 4 common marks, 10.8%
degree of association is 10.8% – 10.8% = 0%

Relation to group C: 6 common marks, 12.3%; 2 unattested marks, 4.1%
degree of association is 12.3% – 4.1% = 8.2%

Relation to group D: 3 common marks, 10.4%; 5 unattested marks, 17.2%
degree of association is 10.4% – 17.2% = -6.8%

ONL 6316

We discern 21 marks on this ostrakon, which originally displayed several more marks that are now lost. The majority of the marks are attested in the sequence of OL 6788 and associated documents (OL 6788: positions, 3, 7, 11, 14, 15, 18, 20, 21, 24, 25, 26, 27, 31, 32, 37, 39, 41, 43 and 44), but they are barely arranged in accordance with that order. Only marks \ddagger and \ddagger , recorded in positions 24 and 25 on OL 6788, are written next to each other, while adjacent marks \ddagger and Υ are listed in that order on ONL 6298. Whether it is a coincidence or not that mark Υ , written above \ddagger on ONL 6316, is inscribed next to \ddagger on O. Cairo JE 72450 is not clear. Another parallel is O. Cairo JE 96603, like O. Cairo 72450 attributed to group D; in the former ostrakon mark \ddagger is adjacent to Υ , as in ONL 6316. These similarities are perhaps meaningful. Although 20 out of the total of 21 marks on ONL 6313 are attested in group C, mark $\Delta\Delta$ occurs only in group D. Moreover, mark $\Delta\Delta$ is not included in the sequence of marks recorded on OL 6788, O. Stockholm MM 14130, O. WV 3 and ONL 6298. This might be an indication that ONL 6316 predates these documents. Since the degree of association for group D is rather high as well, we attribute ONL 6316 to a time between the two groups.

Relation to group A: 8 common marks, 33.3%; 13 unattested marks, 54.2%
degree of association is 33.3% – 54.2% = -20.9%

Relation to group B: 11 common marks, 29.7%; 10 unattested marks, 27.0%
degree of association is 29.7% – 27.0% = 2.7%

Relation to group C: 20 common marks, 40.8%; 1 unattested mark, 2.0%
degree of association is 40.8% – 2.0% = 38.8%

Relation to group D: 14 common marks, 48.3%; 7 unattested marks, 24.1%
degree of association is 48.3% – 24.1% = 24.2%

ONL 6486

Six marks are discernable on this ostrakon, which are partially ordered in accordance with a sequence attested on other pieces (OL 6788, marks 12 – 17 – 23 – 7 – 28 – 21 – 35). The mark between $\overline{\Upsilon}$ and $\overline{\Xi}$ is probably Ϝ . It is evident that ONL 6486 is hardly related to group A, with which it only has mark Ϝ in common. In contrast, all marks are attested in group C. The calculated degrees of association indicate that the ostrakon is only slightly more related to group C than to group D. It is therefore dated somewhere between both groups.

Relation to group A:	1 common mark, 4.2%; 5 unattested marks, 20.8% degree of association is 4.2% – 20.8% = -16.6%
Relation to group B:	3 common marks, 8.1%; 3 unattested marks, 8.1% degree of association is 8.1% – 8.1% = 0%
Relation to group C:	6 common marks, 12.3%; 0 unattested marks, 0% degree of association is 12.3% – 0% = 12.3%
Relation to group D:	4 common marks, 13.8%; 2 unattested marks, 6.9% degree of association is 13.8% – 6.9% = 6.9%

ONL 6504

This ostrakon is preserved in a very unfortunate state. Marks $\overline{\Gamma}$ and ϕ are perfectly clear, and the damaged marks at the upper edge can be identified as ϛ and ϣ . The incompletely preserved mark in the upper left corner might be ϙ , but because that is highly uncertain we should not include it in our comparison of marks. Marks $\overline{\Gamma}$ and ϕ are found in adjacent positions in the sequences of OL 6788 and O. WV 3, but because it is far from clear that the marks on ONL 6504 are listed in a meaningful order, this could be a coincidence. All four marks are indeed attested in group C to which OL 6788 and O. WV 3 belong, but the degree of association for group D is almost as high. ONL 6504 can therefore not be precisely dated and might belong to either group D or C.

Relation to group A:	0 common marks, 0%; 4 unattested marks, 16.7% degree of association is 0% – 16.7% = -16.7%
Relation to group B:	3 common marks, 8.1%; 1 unattested mark, 2.7% degree of association is 8.1% – 2.7% = 5.4%
Relation to group C:	4 common marks, 8.2%; 0 unattested marks, 0% degree of association is 8.2% – 0% = 8.2%
Relation to group D:	3 common marks, 10.4%; 1 unattested mark, 3.5% degree of association is 10.4% – 3.5% = 6.9%

O. Cairo JE 96601

This ostrakon fragment, inscribed on two sides, displays three signs that could be workmen's marks. Like several ostraca from group D it was discovered in the excavations in the Valley of the Kings by Davis and Ayrton in the season 1905-1906, but its exact findspot is not recorded. The great size of the signs and the use of red ink is typical for the group D ostraca, but whether they are marks or not is difficult to say. Sign $\overline{\Gamma}$ is not attested elsewhere. It could be an allomorph of ϕ or perhaps of ϛ . The mark next to it might be ϛ , and the mark on the reverse is perhaps the flower-shaped mark ϣ . These two marks are only securely attested together in ostraca from group C. Because of a possible connection with the group D ostraca, a date between groups D and C is considered for O. Cairo JE 96601.

2. OSTRACA WITH MARKS OF THE 18TH DYNASTY

O. Cairo JE 72492

As mentioned above we expect that the findspot of O. Cairo JE 72492 near the opening to the branch leading to the tomb of Thutmose III is no proper indication of its date, because the archaeological context is rather disturbed. We rely therefore on a comparison to the ostraca in the four key groups. There are 10 marks that are well legible on this ostrakon, but the 11th mark at the right edge is too damaged for a secure identification. The marks are not ordered in accordance with a sequence that we know from other ostraca, but they seem to appear predominantly at the beginning (positions 4 – 11) and the end (positions 39 – 44) of the sequence of OL 6788. In analogy with ONL 6266 we will take mark $\overline{\text{m}}$ as an allomorph of mark m . Mark e is perhaps an allomorph of mark a . With the exception of m , all marks are attested in group C. The latter mark is found in group D, and the degree of association for this group is almost as high as for group C. O. Cairo JE 72492 should therefore probably date to the period of Thutmose IV – Amenhotep III.

Relation to group A:	2 common marks, 8.3%; 8 unattested marks, 33.3% degree of association is 8.3% – 33.3% = -25.0%
Relation to group B:	6 common marks, 16.2%; 4 unattested marks, 10.8% degree of association is 16.2% – 10.8% = 5.4%
Relation to group C:	9 common marks, 18.4%; 1 unattested mark, 2.0% degree of association is 18.2% – 2.0% = 16.2%
Relation to group D:	7 common marks, 24.1%; 3 unattested marks, 10.4% degree of association is 24.1% – 10.4% = 13.7%

ONL 6370

Four marks are visible on ONL 6370, a small part of a limestone ostrakon. The damaged mark on the left edge is in all probability to be reconstructed as r . The marks are not inscribed in adherence to an attested sequence. Once again the small number of marks hinders an attempt to provide an accurate date for the piece. Calculation of the degrees of association is not of much assistance either. The degree is highest for group C, but not at all convincingly so. A relation to group D is suggested by the occurrence of mark $\Delta\Delta$, not found in any of the other core groups. However, mark A is only securely attested in group C. It is also attested on ONL 6789, above attributed to group D. The odds weigh therefore in favour of an attribution of ONL 6370 to group D, if only slightly, but because of the fragmentary state of the ostrakon a date in the period of group C cannot be ruled out.

Relation to group A:	2 common marks, 8.3%; 2 unattested marks, 8.3% degree of association is 8.3% – 8.3% = 0%
Relation to group B:	2 common marks, 5.4%; 2 unattested marks, 5.4% degree of association is 5.4% – 5.4% = 0%
Relation to group C:	3 common marks, 6.1%; 1 unattested mark, 2.0% degree of association is 6.1% – 2.0% = 4.1%
Relation to group D:	2 common marks, 6.9%; 2 unattested marks, 6.9% degree of association is 6.9% – 6.9% = 0%

ONL 6407

This ostrakon must have been inscribed with several identity marks but only marks Ψ , Δ and r are discernable. They are not ordered in accordance with a sequence known from other ostraca. All three marks are both attested in groups D and C, and the degree of association is

higher for the former than for the latter group. There are nevertheless too few marks to provide an accurate date, and ONL 6407 is therefore attributed to groups D and C.

Relation to group A:	0 common marks, 0%; 3 unattested marks, 12.5% degree of association is 0% – 12.5% = -12.5%
Relation to group B:	2 common marks, 5.4%; 1 unattested mark, 2.7% degree of association is 5.4% – 2.7% = 2.7%
Relation to group C:	3 common marks, 6.1%; 0 common marks, 0% degree of association is 6.1% – 0% = 6.1%
Relation to group D:	3 common marks, 10.4%; 0 unattested marks, 0% degree of association is 10.4% – 0% = 10.4%

ONL 6568

Traces of three marks cannot be identified, but the other two marks are \curvearrowright and \boxtimes , situated next to each other. These marks do not point towards a specific sequence known from any of the key ostraca. ONL 6568 is for that reason difficult to date. Mark \boxtimes is attested in all four core groups, while \curvearrowright is found in groups D and C. The ostrakon is hesitantly assigned to these two sets of ostraca.

ONL 6307

Only three marks on this ostrakon can be identified with certainty: $\bar{\delta}$, \curvearrowright and $\hat{\Upsilon}$. A fourth mark could perhaps be \ominus . Because that is uncertain we cannot include this mark in our comparison. The marks on ONL 6307 do not belong to a sequence of marks attested on other ostraca, which renders the task of dating ONL 6307 a difficult one. Groups D and C score highest in terms of the degree of association, and marks \curvearrowright and $\hat{\Upsilon}$ are attested in both groups. With the little information we possess we can only attribute the ostrakon to the period of both groups.

Relation to group A:	1 common mark, 4.2%; 2 unattested marks, 8.3% degree of association is 4.2% – 8.3% = -4.1%
Relation to group B:	1 common mark, 2.7%; 2 unattested marks, 5.4% degree of association is 2.7% – 5.4% = -2.7%
Relation to group C:	3 common marks, 6.1%; 0 unattested marks, 0% degree of association is 6.1% – 0% = 6.1%
Relation to group D:	2 common marks, 6.9%; 1 unattested mark, 3.5% degree of association is 6.9% – 3.5% = 3.4%

ONL 6207

This poorly preserved ostrakon fragment is problematic because the small number of marks does not allow for a more precise attribution than to groups D and C. Marks \curvearrowright and $\pi\pi$ are identified with certainty, and they are found on ostraca from groups D and C. They are not arranged in accordance with a sequence attested on other ostraca. Traces of a third mark are visible above both marks, and belong perhaps to mark $\bar{\Upsilon}$, only securely attested in group C.

2.2.13 Ostraca of uncertain date

The following section deals with 14 instances for which our methods fail to provide a clear indication of the date of an ostrakon. Oftentimes our approaches are hindered by the fact that the ostrakon is poorly preserved and displays only a small number of marks. In other cases,

marks cannot be securely identified due to the crude handwriting of the author of the ostrakon. There are an additional 27 ostraca that are inscribed with a single mark only, which can not be accurately be dated either.

ONL 6331

No more than three marks are visible on this fragmentary ostrakon. The identification of the rightmost marks is difficult. It might be δ , attested on ostraca such as O. Ashmolean HO 892, ONL 6293 and O. UC 31988, but another option is ψ , the allomorph of λ that is only attested on O. Cairo CG 24105. Interestingly, marks \mathfrak{M} , \mathfrak{U} and ψ feature in the same relative position as in the sequence of O. Cairo CG 24105. Yet, the infrequency of ψ weighs against such a reading. This does not aid us much, because the alternative, mark δ , is not attested in the core groups. Marks \mathfrak{M} and \mathfrak{U} are both attested in groups B and C. It is thus impossible to provide an accurate date for this ostrakon. In all likelihood it dates somewhere in the period between Amenhotep II and Amenhotep III.

ONL 6401

Visible are the remnants of four marks, three of which can be identified as \mathfrak{A} , \mathfrak{Y} and \mathfrak{C} . The fourth mark in the top right corner could be \mathfrak{I} (upside down) or \mathfrak{D} , but other marks are plausible as well. Since \mathfrak{A} , \mathfrak{Y} and \mathfrak{C} are attested in all four core groups it is very difficult to date ONL 6401. Marks \mathfrak{Y} and \mathfrak{C} are recorded in adjacent positions on O. Stockholm MM 14130, but this may be coincidental. A relation between ONL 6401 and the Stockholm ostrakon is dubious because this ostrakon records mark \mathfrak{A} between \mathfrak{F} and \mathfrak{I} , neither of which agrees with the traces left of on ONL 6401. The date of this ostrakon remains therefore uncertain.

O. Cairo JE 96285

This ostrakon, divided into two sections, can be interpreted in two different ways, depending on the understanding of \ominus on the left half of the document. The left section is separated from the right half by a vertical line. Whereas the right section contains two lines of workmen's marks, the left section contains a short column of three signs. The middle sign is \ominus , and it is nowhere else securely attested as a workman's mark on ostraca, pottery or other objects. It is true that we have encountered mark \ominus on O. MMA 09.184.770, but there it was interpreted as an allomorph of \mathfrak{D} . That is not possible in this case, because mark \mathfrak{D} is inscribed in the right section of O. Cairo JE 96285 and is of distinctly different shape than \ominus . There is an alternative to the understanding of sign \ominus , but it is a provocative one. Instead of taking \ominus as a workman's mark, this and the other signs in the column in the left section of the column may be hieratic and cursive hieroglyphic signs, together spelling the word *irp* 'wine'. This reading is debatable, because signs \mathfrak{P} and \mathfrak{U} certainly are attested as workmen's marks. Moreover, the word would then have been written in a column instead of horizontally as scribes are wont to do in documentary texts, and the word would be lacking a determinative. More importantly, it would represent a unique instance in the 18th Dynasty of the use of marks in combination with script. A single extremely brief hieratic note has been discovered near the tomb of Amenhotep III,⁴⁹ but otherwise 18th Dynasty hieratic ostraca are, as emphasised in the previous chapter, not forthcoming in the community of necropolis workmen. Nevertheless, the sole mention of wine without any further information, written with two hieroglyphic signs and one hieratic sign, would not be completely unexpected in the context of an ostrakon with marks. As will have become clear by now, ostraca with marks from the 18th Dynasty are everything but explicit about the content of the documents as well. In

⁴⁹ Yoshimura (ed.), *Research in the Western Valley II*, 88; 89, fig. 52; pl. 32, nr. 427.

addition, the hieratic writing for ‘wine’ is ubiquitously found on jar docketts from the proximity of the tomb of Amenhotep III,⁵⁰ and therefore it is not unlikely that workmen were able to read and spell this word.

Yet, the interpretation is far from certain, and the signs could be workmen’s marks. Mark  would then appear exclusively on O. Cairo JE 96285. Taking each sign as a mark, the ostrakon would probably have to be attributed to group B or C. No sequence of marks on other ostraca agrees with that of O. Cairo JE 96285, but the sequence of OL 6788 would be related. The marks would correspond mostly to the last quarter of this sequence (positions 5, 10, 13, 31, 35, 37-38, 40-41). Despite a higher degree of association with group B, O. Cairo JE 96285 would then display seven out of eight marks that are also attested in group C.

Relation to group A:	4 common marks, 16.7%; 4 unattested marks, 16.7% degree of association is 16.7% – 16.7% = 0%
Relation to group B:	6 common marks, 16.2%; 2 unattested marks, 5.4% degree of association is 16.2% – 5.4% = 10.8%
Relation to group C:	7 common marks, 14.3%; 1 unattested mark, 2.0% degree of association is 14.3% – 2.0% = 12.3%
Relation to group D:	1 common mark, 3.5%; unattested marks, 24.1% degree of association is 3.5% – 24.1% = -20.6%

Would one opt for the second interpretation and read the left section as a textual inscription, the ostrakon would best be attributed to group B. That would be indicated by the degree of association with group B, but also by the fact that each mark would then be attested in group B.

Relation to group A:	4 common marks, 16.7%; 2 unattested marks, 8.3% degree of association is 16.7% – 8.3% = 8.4%
Relation to group B:	6 common marks, 16.2%; 0 unattested marks, 0% degree of association is 16.2% – 0% = 16.2%
Relation to group C:	5 common marks, 10.2%; 1 unattested mark, 2.0% degree of association is 10.2% – 2.0% = 8.2%
Relation to group D:	1 common mark, 3.5%; 5 unattested marks, 17.2% degree of association is 3.5% – 17.2% = -13.7%

O. UC 45683

The date of this ostrakon is rather problematic because we are not sure how to interpret it. The second mark from the left in the upper line seems to be a crudely drawn instance of , attested in groups A and B. It appears on O. Cairo JE 72498 (group A) in a very similar shape. The rightmost mark in the upper line seems to be . This mark too is securely attested in group A, and is present on O. Cairo JE 72498. The fifth mark of the same line poses a problem. It resembles  but possesses a rounded element underneath it. Possibly this is a more elaborate allomorph of the seemingly abstract mark .⁵¹ We shall here tentatively consider it as such, and some support for this idea is provided by O. Cairo JE 72490. On this ostrakon from group A,  is situated immediately next to  as on O. UC 45683. Marks ,  and  are all

⁵⁰ Yoshimura (ed.), *Research in the Western Valley II*, 68-72, figs. 43-47, pls. 29-31, nrs. 280+281-283, 285-290, 404-406.

⁵¹ It could be indicative of the inspiration for this particular mark, perhaps a bovine head with horns *en face*?

2. OSTRACA WITH MARKS OF THE 18TH DYNASTY

known from the group A ostraca, suggesting O. UC 45683 might date to the same time. The degree of association with group A is by far the highest as well. Yet, mark $\Pi\Pi$ – probably an allomorph of Π , and mark Γ appear only on later ostraca from groups D and C. It is hard to explain their presence on O. UC 46863. In addition, the sequence $\Sigma - \Pi\Pi - \smile$ on this ostrakon is reminiscent of the end of the sequence of OL 6788 (group C), which features $\Pi\Pi - \smile - \Sigma$. This order may or may not be coincidental, but an attribution to group A does still not seem convincing because of marks $\Pi\Pi$ and Γ . The date of O. UC 46863 thus remains obscure.

Relation to group A:	9 common marks, 37.5%; 2 unattested marks, 8.3% degree of association is 37.5% – 8.3% = 29.2%
Relation to group B:	6 common marks, 16.2%; 5 unattested marks, 13.5% degree of association is 16.2% – 13.5% = 2.7%
Relation to group C:	9 common marks, 18.4%; 2 unattested marks, 4.1% degree of association is 18.4% – 4.1% = 14.3%
Relation to group D:	6 common marks, 20.7%; 5 unattested marks, 17.2% degree of association is 20.7% – 17.2% = 3.5%

O. Cairo CG 25327 bis

Five different signs are inscribed on this ostrakon, but it is not entirely clear if they are workmen's marks. The hesitation is caused by the first sign from the left, which is completely preserved but still cannot be identified with a mark attested on other ostraca or objects. Its meaning is utterly unclear. In contrast, the signs to its right are known as workmen's marks: we recognise λ , followed by two superimposed instances of the same sign, perhaps — or — turned upside down. The next sign is Ψ . With only two securely identified marks, O. Cairo CG 25327 bis is impossible to date accurately, and it should be emphasised that it is doubtful if the signs are workmen's marks at all. If one does interpret them as such, an attribution to group A seems least likely because marks — , — and Ψ are not securely identified on ostraca from that group.

O. BTdK 832

The style of this ostrakon is distinctly different from other 18th Dynasty ostraca, which beckons the question if it is inscribed with marks or not. Odd is also the difference in the sizes of the shapes. Moreover, some signs are drawn as silhouettes rather than as outlines. If one sets out to identify the signs as marks one recognises perhaps β , λ , Π , \wedge , \times , \circ , — and — . Marks Π and \wedge are not found on the ostraca of the four core groups. Calculating the degree of association for each group without taking these two marks into account the remaining six hesitantly identified marks are only slightly indicative of an attribution to group C:

Relation to group A:	3 common marks, 12.5%; 3 unattested marks, 12.5% degree of association is 12.5% – 12.5% = 0%
Relation to group B:	3 common marks, 8.1%; 3 unattested marks, 8.1% degree of association is 8.1% – 8.1% = 0%
Relation to group C:	4 common marks, 8.2%; 2 unattested marks, 4.1% degree of association is 8.2% – 4.1% = 4.1%
Relation to group D:	2 common marks, 6.9%; 4 unattested marks, 13.8% degree of association is 6.9% – 13.8% = -6.9%

On the other hand, mark  is attested in group B exclusively. Moreover, marks \sqcap and \wedge do feature on O. MMA 09.184.700, a piece we had attributed to group B. For this reason, O. BTdK 832, if indeed inscribed with workmen's marks, is best assigned to this group.

ONL 6341

ONL 6341 is inscribed with two marks exclusively, probably mark  and mark . The latter mark, not attested in the four core groups, is perhaps an allomorph of . This cannot be verified because  and mark  are nowhere attested together in a recurring sequence. The presumed allomorph of  resembles mark  that is attested on ONL 6402 and ONL 6424. Both pieces were tentatively attributed to group A. Associating ONL 6341 with that group is problematic because mark  is only securely attested in group D, and on O. MMA 09.184.786 attributed to groups B–D. It is therefore impossible to date the ostrakon with any precision.

ONL 6362

The marks on this ostrakon are not inscribed in a sequence that we know from other documents. The two leftmost marks are oddly executed and therefore not straightforwardly recognisable. They are here – extremely tentatively – identified as  and . If mark Γ in group A is an allomorph of mark Γ , all marks on ONL 6362 but  are attested in this group, while all six marks are attested in group C. Yet, the degree of association with group A is higher than with group C. Because the identification of two of the six marks is very uncertain, we are forced to conclude that ONL 6362 cannot be accurately dated.

Relation to group A:	5 common marks, 20.8%; 1 unattested mark, 4.2% degree of association is 20.8% – 4.2% = 16.6%
Relation to group B:	4 common marks, 10.8%; 2 unattested marks, 5.4% degree of association is 10.8% – 5.4% = 5.4%
Relation to group C:	6 common marks, 12.3%; 0 unattested marks, 0% degree of association is 12.3% – 0% = 12.3%
Relation to group D:	3 common marks, 10.4%; 3 unattested marks, 10.4% degree of association is 10.4% – 10.4% = 0%

ONL 6589 and ONL 6457

ONL 6589 is considered as an ostrakon from the 18th Dynasty because of the occurrence of mark , not attested in the Ramesside Period. Such a date is however contestable because of the presence of a damaged mark that might be . This mark is not securely attested in the 18th Dynasty as a workman's mark on ostraca or in any other context. Perhaps the only other instance of mark  in the 18th Dynasty is the equally poorly preserved and enigmatic ostrakon ONL 6457. A date for this ostrakon in the 18th Dynasty is suggested by the occurrence of mark , not attested in the Ramesside period.⁵² Both documents are therefore cautiously dated to the 18th Dynasty. Apart from marks  and perhaps , ONL 6589 is inscribed with , attested in groups A, B and C. Mark  is only attested in groups D and C, and the ostrakon is best attributed to the time of these two groups. ONL 6457 is inscribed with two instances of mark , and marks ,  and . These marks are not indicative of the date of the ostrakon. Mark  is only attested in group D, and since we have attributed ONL 6589 to groups D – C, we may suggest a similar date for ONL 6457 on account of mark .

⁵² We will encounter mark  in the late 20th Dynasty (see chapter 4, 4.2.17, O. Cairo JE 96614), which does resemble mark , but the style of the ostrakon is more befitting of an 18th Dynasty date.

ONL 6608

This fragmentary ostrakon is inscribed in charcoal with crudely drawn marks, or perhaps rather signs or scribbles. With some imagination one can make out (fragments of) Γ , ϵ and Υ , all three attested as workmen's marks in the 18th Dynasty. Yet, the ductus of these signs differs from that of all other 18th Dynasty ostraca with marks to such an extent that it is very uncertain if these signs are to be interpreted as marks.

O. IFAO C 1298

Two marks are discernable on this very fragmentary ostrakon: \ddagger and Υ , which are not attested in adjacent positions in a meaningful sequence. The latter mark is attested in all four key groups, the former only in groups A, B and D. The ostrakon is therefore dated to a period prior to the reign of Amenhotep III.

ONL 6520

It is somewhat difficult to establish a date for this ostrakon because the marks with which it is inscribed are rather damaged. Marks \ddagger , Ψ and β can be discerned without any problems. Particularly the latter mark points towards a date in the 18th Dynasty. We have encountered mark \ddagger on ONL 6405 (attributed to group B) and ONL 6444 (attributed to group C), where they appear probably as an allomorph of mark \star . Right of mark Ψ we make out mark Π , not attested in the ostraca from the four core groups but present among other ostraca on O. MMA 09.184.770 and O. Brock 27, both attributed to group B. The faintly visible mark right of Π is probably Υ , and traces of the marks in the lower section of the ostrakon are tentatively identified as \wp , \top , β and ϕ . Two or perhaps rather one mark in the left upper corner of the ostrakon is as interesting as it is difficult to interpret. Immediately left of mark \ddagger we see a mark that could well be ∇ , and just below it a second sign that is clearly $\underline{\text{z}}$. Now the latter sign is not attested in the 18th Dynasty as a mark, and it challenges our provisional date of the ostrakon. We may consider a later date, but that is equally problematic because we will see in the following chapters that marks \wp , \top , β and ϕ are no longer attested in the Ramesside Period. A solution to this conundrum would be to suggest that signs ∇ and $\underline{\text{z}}$ are two elements of one single workmen's mark, used as an elaborate allomorph of mark ∇ . The evidence in favour of this argument runs ahead of current matters, but if we steal a quick look at the marks that were in use during the 19th Dynasty (chapter 5) and the 20th Dynasty (chapters 3 and 4), it becomes clear that there are several marks that consist of more than a single element. One of many examples from the 20th Dynasty is Γ , a single mark consisting of two hieroglyphic signs for *hm* and *ntr*, employed to refer to a workman called *Pahemnetjer*.⁵³ A revealing example from the 19th Dynasty is \mathcal{L} , a mark consisting of the *m3* sickle \wp (Gardiner U1) in combination with the determinative ∇ (Gardiner D4), together forming a sign coded by Gardiner as U4 and used in spellings of the verb *m33* 'to see'. In the 19th Dynasty mark \mathcal{L} referred to a workman named *Maaninakhtuef*.⁵⁴ This mark is not securely attested before the 19th Dynasty, but there is a possibility that we encounter it in the 18th Dynasty on ONL 6520 for the first time. This however is nothing but a careful suggestion, because the mark is not elsewhere found in the 18th Dynasty. Moreover, apart from the ubiquitous mark \mathcal{E} consisting of the elements *nb* and *t3.w.y*, 18th Dynasty marks that comprise of more than one element are as yet unknown. Even if one accepts the assumption that \mathcal{L} constitutes a single mark on ONL 6520, we cannot be sure if it was used as an allomorph of ∇ . If it were, we obtain some insight into the identity of the workman behind the mark: the instance with the sickle suggests that mark ∇ holds a phonetic value. In

⁵³ See chapter 3, p. 217.

⁵⁴ See chapter 5, p. 405- 407.

analogy with the 19th Dynasty mark, it would be plausible that the 18th Dynasty marks  and  referred to a man with the element *mꜣꜣ* in his name, perhaps another Maaninakhtuef. Unfortunately we cannot substantiate this hypothesis, and no man of this name is attested at Deir el-Medina during the 18th Dynasty.

Regardless of the identity behind the mark, we shall here assume that  is the same mark as , which in our four core groups is attested in group B exclusively. Still, proposing a date on the basis of the marks that appear in the core groups is difficult. There are six marks that belong to group B and seven that are attested in group C. The calculated degree of association is almost identical for both groups:

Relation to group A:	2 common marks, 8.3%; 7 unattested marks, 29.2% degree of association is 8.3% – 29.2% = -20.9%
Relation to group B:	6 common marks, 16.2%; 3 unattested marks, 8.1% degree of association is 16.2% – 8.1% = 8.1%
Relation to group C:	7 common marks, 14.3%; 2 unattested marks, 4.1% degree of association is 14.3% – 4.1% = 10.2%
Relation to group D:	5 common marks, 17.2%; 4 unattested marks, 13.8% degree of association is 17.2% – 13.8% = 3.4%

Significant perhaps is the occurrence of mark , which like  is attested only in group B. Additionally, mark  is attested on O. Brock 27 and O. MMA 09.184.770, both attributed to group B as well. The latter ostracon has four marks (, ,  and ) in common with ONL 6520. Mark  on ONL 6520 is only securely attested in group C, but occurs on O. KV 10004 too, which we have also attributed to group B. Should we be correct in assigning ONL 6520 to the 18th Dynasty, it must have been created during the time of the group B ostraca.

O. IFAO C 2503

The inscription on the obverse of this ostracon is very damaged, but it may have contained workmen's marks. The leftmost mark could be , attested in groups B and D. The other marks are not identifiable. The reverse is inscribed with a single and very large instance of mark .

Ostraca with a single mark

There are 27 ostraca, datable to the 18th Dynasty, which are inscribed with a single mark only. These documents are of course extremely difficult to date. A list is here provided with the marks and the groups in which they are attested. There is too little evidence to assign a specific date to these ostraca.

ONL 6198		B, C
ONL 6202		B, D, C
ONL 6206	 ⁵⁵	-
ONL 6326		D
ONL 6330		A, C ⁵⁶
ONL 6332		A, B, C, D
ONL 6333		B, C
ONL 6334		B, D, C
ONL 6335		B, D, C

⁵⁵ If indeed an allomorph of mark .

⁵⁶ Attested on ONL 6298 securely attributed to group C.

2. OSTRACA WITH MARKS OF THE 18TH DYNASTY

ONL 6336	𐎓	A (?), C
ONL 6343	𐎔	A, B, C
ONL 6345	𐎕	A, B, C
ONL 6352	𐎖	B, D, C
ONL 6353	𐎗	B, C
ONL 6357	𐎘	B
ONL 6363	𐎙	A, B, D, C
ONL 6368	𐎚	C
ONL 6369	𐎛	A, C
ONL 6390	𐎜?	- ⁵⁷
ONL 6398	𐎝	A, B
ONL 6403	𐎞	A, B, C
O. IFAO C 1443	𐎟	
O. IFAO C 2503	𐎠	A, B, D, C
O. IFAO C 3271	𐎡	A, B, D, C
O. IFAO C 7635	𐎢	C
O. KV 63	𐎣	A, B, D, C
O. OIM 19206 ⁵⁸	𐎤	A, B, D, C

TABLE 16. OSTRACA FROM THE 18TH DYNASTY INSCRIBED WITH A SINGLE MARK

2.2.14 Identity marks from the end of the 18th Dynasty

It is evident that the group of ostraca attributed to group C is by far larger than other groups. This can be explained in different ways that need not be mutually exclusive. First of all, the higher figure may be the result of a bias in the archaeological material, as older material generally has a smaller chance of surviving than younger material.⁵⁹ Secondly, the high number may be seen as evidence that later in the 18th Dynasty the need for ostraca with marks or rather the wish to produce them had increased. This idea will be explored further below.⁶⁰

Another explanation is that some of the ostraca in group C do not date to the reign of Amenhotep III, but to a somewhat later period. We have no anchor points for the time after the reign of Amenhotep III at our disposal and there are no clear indications that any ostrakon should date to the time of Amenhotep IV / Akhenaten or one of his successors. For that reason all ostraca that are datable to the period subsequent to the group D ostraca have been ascribed to group C, associated with the reign of Amenhotep III. In each case we had good reasons for such an attribution, but the possibility exists that some ostraca date in fact to a slightly later period.

Frustratingly, we lack clear evidence of the production of ostraca with workmen's marks from the period after the reign of Amenhotep III, with perhaps the exception of ostrakon O. KV 63, which bears mark 𐎣. Reportedly, this ostrakon was found in the shaft of O. KV 63. This rock-cut space in the central area of the Valley of the Kings may have been cut already in the reign of Amenhotep III,⁶¹ and seems to have been used as an embalmers cache at some point in or near the reign of Tutankhamun.⁶² The piece is a limestone chip and displays a mark drawn in the upper right corner. Instead of an ostrakon, it may be designated

⁵⁷ Attested on ONL 6402 and ONL 6424, attributed to group A.

⁵⁸ Also inscribed with a series of strokes, see below, 2.3.4.5.

⁵⁹ More on this matter, see below, p. 165.

⁶⁰ See below, 2.4.

⁶¹ Eberhard Dziobek, Michael Höveler-Müller and Christian E. Loeben (eds.), *The Mysterious Tomb 63. The Latest Discovery in the Valley of the Kings. Art and Archaeology of Susan Osgood* (Rahden 2009), 63.

⁶² Schaden, 'Amenmesse Project 2006', 237; Dziobek, Höveler-Müller and Loeben (eds.), *The Mysterious Tomb 63, 64*.

as a name stone with a mark.⁶³ Whatever its exact function may have been, the piece lends some credence to the idea that identity marks were still employed after the reign of Amenhotep III, and that ostraca with marks continued to be created. Still, the date of this piece in the late 18th Dynasty is not secured, because KV 63 was clearly disturbed, presumably during the Ramesside Period.⁶⁴

That is also suggested by the pottery that was apparently found within the embalmers cache of KV 63. Seven of the published ceramic vessels⁶⁵ display signs that we recognise as 18th Dynasty workmen's marks: √ (inscribed twice on the same vessel); Ψ; ^; ▣; ⚡ (or ⊕); and finally ☼ (attested on two vessels), which is unattested on ostraca but occurs on a ceramic jar from the tomb of Kha.⁶⁶ Mark ^ is attested on O. BTdK 832, the date of which is very uncertain, and on O. MMA 09.184.700, attributed to group B. The mark is quite rare and it is not attested in group C. However, if mark ^ is in fact an allomorph of mark ~, attested on pottery near the tomb of Amenhotep III, its presence in KV 63 is not very surprising. The other marks are all present in group C.

Even though we are familiar with the marks that come from KV 63, we are not sure how to precisely date the objects on which they appear. The cache was probably furnished after the reign of Amenhotep III, but according to Schaden the chamber itself was prepared before that time. More importantly perhaps, we ask ourselves why vessels marked and probably originally owned by necropolis workmen ended up in an embalmers cache. We do not possess enough data to provide any answer.

Nevertheless, we have to acknowledge the possibility that workmen's marks were still in use in the period of Tutankhamun and that the repertory of that time did not differ substantially from that of the period of Amenhotep III. Hence, some of the ostraca attributed to group C could originate from the end of the 18th Dynasty as well.

2.3 THE PURPOSE OF THE OSTRACA WITH IDENTITY MARKS

2.3.1 Introduction

In the previous section the 18th Dynasty ostraca with marks were each assigned a provisional date. Some problematic cases aside, we seem to be able in some measure to follow the chronological distribution of marks. In addition, it has been observed that several ostraca are inscribed with more or less the same sequence of marks. This sequence appears to be meaningful, and its influence can even be detected on ostraca with marks that are not neatly inscribed in accordance with the ordered sequence: they display clusters of marks that are adjacent or almost adjacent in the fixed sequence, or they record a series of marks in accordance with their relative position in the fixed sequence. Apart from these insights, the 18th Dynasty ostraca remain, much to our regret, highly enigmatic. In the sections below we will attempt to deduce the meaning and purpose of the documents in question, but it will become clear that the results are highly unsatisfactory. This is due to the fact that the subject matter of almost every single ostrakon is not explicated in any way. It will be shown that there are numerous ostraca in which strokes and/or dots accompany the marks, but their exact function is unclear: we lack every form of context. Even if we would know the identity behind every single 18th Dynasty workman's mark, and if the strokes and dots were instead

⁶³ See below, 2.3.4.5.

⁶⁴ Schaden, 'Amenmesse Project 2006', 232.

⁶⁵ Schaden, 'Amenmesse Project 2006', 231-254, fig. 23. Another flower-shaped mark is visible on a blue painted jar from the tomb (a drawing and a photo are available on <http://www.kv-63.com/photos2010.html>), but it is not clear if the mark was added before or after firing of the jar. It may therefore be a potters' mark rather than a workman's mark.

⁶⁶ Turin S. 8436 RCGE 19788, see Schiaparelli, *La tomba*, fig. 121, 3.

perfectly legible hieratic numerals, it would nonetheless be left to our imagination what the ostraca record exactly because they omit headings that inform us of their content. In the absence of contemporary hieratic documentary texts about the necropolis workmen we cannot compare the ostraca with marks to written records, and we are ignorant as to the structure of the tomb administration and particularly to those matters the workmen and their supervisors would have deemed worthy to note down during this period.

Indeed, one is inclined to interpret the majority of ostraca in the context of the administration of labour at the worksite and the provision of the workforce. That is suggested by the usage of dots and strokes, most likely evidence of simple forms of bookkeeping. There are no indications that we should seek the purpose of the ostraca with marks in the domains of religion or magic. Were this the case, one would expect the mention or depiction of deities and religious or magical symbols. Additional evidence against the idea that ostraca with marks are related to religious or magical practices comes from the much better understood Ramesside ostraca with marks. The majority of these documents are demonstrably administrative documents, created within the context of the collective tomb administration or to record private transactions and accounts. None of the ostraca point towards a magical or religious meaning. Moreover, the ostraca have not been found in a context that would require such an explanation.

2.3.2 The provenance of the 18th Dynasty ostraca from Deir el-Medina

The provenance of most of the 18th Dynasty ostraca – when recorded at all – is hardly indicative of their purpose. In fact, very little is known about the exact findspots of the ostraca. It has been pointed out that several ostraca were discovered in the Valley of the Kings, often close to tombs. In the case of the ostraca from the West Valley the ostraca were found in or near the huts located close to the tomb of Amenhotep III. Whether the other ostraca from the Valley of the Kings originated from similar huts is unclear. But even if that were the case, we have no way of determining what role these ostraca played. The workmen's huts are evidently not far removed from the worksites, which would suggest the ostraca are related to the administration of work. On the other hand, the provenance of the ostraca in the area of huts may point towards a more domestic and private sphere. One may even speculate that some ostraca inscribed solely with marks were intentionally left behind by the workmen in the vicinity of the royal tomb they had prepared, as a sort of ex-voto. Particularly in the case of O. Cairo JE 72490 and perhaps O. Cairo JE 96650 this would not be an implausible hypothesis. The handwriting of their inscription indicates that it was written with much care, and no dots or strokes were added to the marks. More importantly, the ostrakon was discovered in the same area that was used for foundation deposits of Thutmose III and his queen.⁶⁷ Like the name stones deposited in the walls of the more or less contemporaneous sanctuaries at Deir el-Bahari,⁶⁸ O. Cairo JE 72490 may conceivably have been buried at the same site as an ex-voto on behalf of the entire crew.⁶⁹

⁶⁷ Site 13 of the Carnarvon-Carter excavations, see Reeves, *Valley of the Kings*, 329; Haring, 'Workmen's Marks on Ostraca', 153.

⁶⁸ Name stones inscribed with hieroglyphs, recording Senenmut and contemporaneous architects were found in the walls of the tomb of Senenmut and presumably also the valley temple of Hatshepsut, see Hayes, *Ostraka*, 45-47; some of the stones inscribed with marks discovered in the fill of the causeway of the temple of Thutmose III at Deir el-Bahari may have been deposited there by individual workmen; for a discussion see Budka, 'Non-Textual marks', 179-193.

⁶⁹ Several hieratic ostraca with name lists of workmen have been found in the Valley of the Kings, but most of these are administrative documents rather than ex-votos. Votive offerings and religious objects of the necropolis workmen have been found in the workmen's huts in the Valley of the Kings, but are not attested in association with royal tombs. On the other hand, votive graffiti from the Ramesside Period are numerous in the Valley of the

None of this can, however, be proven. The provenance of the 18th Dynasty ostraca found in the village of Deir el-Medina does not prove or disprove any of the suggested purposes. Only in a few cases has the findspot been recorded, and we can distinguish three sectors. The locations are discussed below for the sake of completeness, if only to illustrate the problem that is connected with all ostraca from Deir el-Medina, whether inscribed with marks, hieratic texts, or any other content: in very few cases are the exact circumstances of the discovery of an ostrakon documented; when such information is available, the provenance is only rarely indicative of the date or the purpose of the ostrakon. There are examples of groups of Ramesside ostraca, both in hieratic and with marks, that are similar in content and that were discovered at the same location as well. In these instances, the findspot is proof that the documents were originally kept together.⁷⁰ Still, the *provenance itself* explains little about the *purpose* and *use* of the ostraca, because in most cases the ostraca were found at a dump site. It is rather the content of the ostraca *combined* with a shared provenance that is significant. Because the precise meaning of many of ostraca with marks is unclear, the findspots of the ostraca are of limited value.

1. The Grand Puits

At least five ostraca were discovered in or near the Grand Puits, the large pit to the north east of the village to which so many hieratic ostraca as well as domestic and cult objects found their way. The pit appears to have been used as dump site some time in antiquity,⁷¹ and the ostraca from this location were surely found outside of their original context.

ONL 6589	Grand Puits
OL 6788	Kom Grand Puits
ONL 6457	Kom Grand Puits
ONL 6214	Qurnet Murai North, probably Kom Grand Puits
ONL 6216	Qurnet Murai North, probably Kom Grand Puits
ONL 6293	Qurnet Murai North, probably Kom Grand Puits

2. Dump sites around the village

At least four ostraca were recovered from spots just outside of the enclosure wall around the houses of the village in what are probably dump sites as well. Because the location of these sites, it is likely that the discarded material originated from the houses of the village.

ONL 6287	village, south east quarter of enclosure wall
ONL 6266	vicinity of tomb DM 1360 in the Western Cemetery, probably from houses
ONL 6305	vicinity of tomb DM 1360 in the Western Cemetery, probably from houses
ONL 6514	perhaps room III in house S.O. IV (located opposite of tomb DM 1360)

3. The area north of the houses and the vicinity of the Kom 2

Kings, see Dorn, *Arbeiterhütten*, 192-193; Sławomir Rzepka, *Who, where and why. The rock graffiti of members of the Deir el-Medina community* (Warsaw 2014), 266-273; 276.

⁷⁰ Some fortunate exceptions of groups of hieratic ostraca that were found together at a particular site are discussed by Koen Donker van Heel, 'Clusters of individual handwritings and the duplication of information in the administrative documents from Deir el-Medina' in: Koen Donker van Heel and Ben J.J. Haring, *Writing in a Workmen's Village. Scribal Practice in Ramesside Deir el-Medina*. EU 16 (Leiden 2003), 39-82. See also chapter 3, 3.3.14; 3.3.20.

⁷¹ Most probably not before the 20th Dynasty, see Bruyère, *Rapport 1948-1951*, 129-130; Raphael Ventura, 'On the location of the administrative outpost of the community of workmen in Western Thebes' *JEA* 73 (1987), 155-157; Delphine Driaux, 'Le Grand Puits de Deir el-Medina et la question de l'eau : nouvelles perspectives' *BIFAO* 111 (2011), 111-137.

At least three ostraca were found near tombs TT 290 and TT 291, adjacent to the so-called Kom 2. This *kom* too is a dump heap that covered the area between TT 290 and TT 357, which yielded a high amount of ostraca inscribed with literary compositions, besides some documentary ostraca from the 19th and 20th Dynasty.⁷² The heap covered several votive chapels, but the exact date of these structures is not clear. ONL 6340 was found near tomb TT 215, not far removed from the same heap. The exact findspot of ONL 6298 is unknown, but it may have come from the vicinity of tombs north-west of the houses of the village. These five ostraca were all found near votive chapels and tombs, so it would seem possible that they were produced for a votive purpose. Yet, three of the five ostraca are clearly of a documentary nature, because the marks are accompanied by dots and strokes.⁷³

OL 6789	perhaps (the vicinity of) tomb TT 291 in the Western Cemetery
ONL 6210	south east of tomb TT 290 in the Western Cemetery
ONL 6520	east of tomb TT 290 in the Western Cemetery
ONL 6340	<i>kom</i> south of tomb TT 215 in the Western Cemetery
ONL 6298	excavated in year 1922: the Western Cemetery, i.a. area of TT 8, tomb of Kha; tomb DM 1138 of Amenwahsu; TT 291, tomb of Nu and Nakhtmin

2.3.3 The administrative ostraca from Deir el-Bahari

The majority of the ostraca with marks must have been of an administrative nature. In the absence of written documentary texts from the 18th Dynasty community of workmen, one is tempted to widen one's gaze and look across the borders of the Royal Necropolis. During the reign of Hatshepsut the construction of a large tomb for Senenmut (TT 71 + TT 353) was part of the building activity at Deir el-Bahari. Documents from the worksite include figurative ostraca with studies of draughtsmen,⁷⁴ as well as ostraca with hieroglyphic inscriptions that were interpreted as *Vorlagen* used in the decoration of the tomb.⁷⁵ But more revealing for our current aims are the ostraca with hieratic inscriptions. Apart from copies of funerary and religious texts, copies of literary texts, and letters, the hieratic ostraca from the construction site record the day-to-day administration of the preparation of the tomb. There are records of the progress of labour, notes of inspections, lists of the workmen employed in the project, lists of rations and supplies, dates, measurements, and isolated names.⁷⁶

The 18th Dynasty ostraca with workmen's marks from the Royal Necropolis are best comparable to the latter type of administrative documents. Interesting are documents such as ostrakon nr. 62,⁷⁷ which records the total in cubic rods (*nby*) that was excavated by a group of masons over the course of one day. Other documents⁷⁸ record the individual progress of workmen, each occupied with a different task: cutting out sections of rock, trimming of sections of rock, as well as polishing and painting. Records of the supplies needed in the preparation of the tomb are preserved as well.⁷⁹ They document the men who were sent to bring quantities of plaster, water, wood and other supplies. Ubiquitous are lists of individuals involved in the construction project.⁸⁰ The lists are accounts of the distribution of rations, records of absence or of activity at the worksite, but in some cases⁸¹ the ostraca are not

⁷² Gasse, 'Le K2', 109-120.

⁷³ ONL 6298; ONL 6340; ONL 6520.

⁷⁴ Hayes, *Ostraka*, 5.

⁷⁵ Hayes, *Ostraka*, 5-6.

⁷⁶ Hayes, *Ostraka*, 5-6.

⁷⁷ Hayes, *Ostraka*, 21, pls. XIII.

⁷⁸ E.g. ostraca nrs. 63, 64, 66-69, 71-76, see Hayes, *Ostraka*, 21-23, pls. XIII-XVI.

⁷⁹ E.g. ostraca nrs. 64 and 65, see Hayes, *Ostraka*, 22, pls. XIII-XIV.

⁸⁰ Ostraca nrs. 82-96, see Hayes, *Ostraka*, 23-25, pls. XVII-XIX.

⁸¹ E.g. ostraca nrs. 88 and 89, see Hayes, *Ostraka*, 24, pl. XVIII.

explicit about the meaning of the lists. Groups of masons are sometimes not individually listed but are instead mentioned as a group, e.g. “the 13 masons”, but other ostraca enumerate each individual. Ostraca nrs. 98-115⁸² record dates, sometimes in combinations with a proper name, or are inscribed solely with a proper name. Similar brief notes are found on ostraca 116 – 120,⁸³ which appear to document an individual’s output over the course of one day.⁸⁴

Now there are of course no data that indicate to what extent the administration of the work on the tomb Senenmut overlaps with that of the construction of the royal tomb. The fact alone that hieratic accounts written on ostraca were discarded at the worksite of Deir el-Bahari but not at the construction sites in the Valley of the Kings is a stern warning that the organisation and documentation of work at the two locations may have been very different. Nevertheless, the tomb of Senenmut is of such a grand scale that its preparation must have been in a certain degree similar to that of the royal tomb. Indeed, the architectural features of his tomb resemble that of royal tombs of the 18th Dynasty and that of Hatshepsut in particular, despite the fact that Senenmut was no member of the royal family.⁸⁵ It has even been suggested that the tomb was decorated by artisans of the royal workshop.⁸⁶ For these reasons, and for the lack of a better option, the administrative texts pertaining to the construction of Senenmut’s tomb will serve as a framework for the discussion of the possible meaning and purpose of ostraca with marks from the community of the Royal Necropolis workmen.

2.3.4 Analysis of the layout of ostraca with marks

The accounts created with marks on ostraca from the 18th Dynasty occur in many different formats. In most cases it is not possible to connect a particular layout with a specific type of document. Nevertheless, a closer look at the ways in which the marks are arranged on ostraca reveals various aspects of the administration of labour during the 18th Dynasty and of the individuals that were involved in this process.

2.3.4.1 Colour use

The 18th Dynasty ostraca were evidently made by individuals who had access to scribal material such as pens and ink. The marks are written in red and/or in black ink, the two colours that are generally used in Egyptian administrative texts. Some ostraca are written entirely in black ink, for other documents only red ink was used. The use of black ink is slightly more frequent than the use of red ink, but no pattern can be detected in the choice for either colour. As far as the material provides any indications, the choice for a particular colour is not bound to a specific provenance or a specific document type. Some ostraca are inscribed with two colours of ink.⁸⁷ The usage of a second colour can mostly be explained as later additions to an existing record, or as different sections on an ostrakon that were inscribed at different moments.

⁸² Hayes, *Ostraka*, 25, pls. XX-XXI.

⁸³ Hayes, *Ostraka*, 26, pl. XXII.

⁸⁴ Among the hieratic administrative records made during the construction of sanctuaries at Deir el-Bahari during the reigns of Hatshepsut and Thutmose III are very similar records such as name lists, often headed by a date, which record the labour performed by individual workmen, or the presence and absence of workmen, see Hayes, ‘Tuthmoside Ostraca’, 31 and pls. IX-IXa, ostrakon nr. 2; 47-48 and pls. XIII-XIIIa, ostrakon nr. 21.

⁸⁵ Particularly but not exclusively in the separation of the cult chamber and the funerary chamber, see Dorman, *The Tombs of Senenmut*, 163 and n. 469.

⁸⁶ Peter F. Dorman, ‘The Tombs of Senenmut’ in: Roehrig (ed.), *Hatshepsut*, 131.

⁸⁷ O. Cairo CG 24106; O. Cairo JE 96590; O. MMA 09.184.700; ONL 6354; and O. WV 10; use of different colours for different sides of an ostrakon: ONL 6214 and ONL 6348.

2.3.4.2 Ostraca with marks arranged in rows

During the 18th Dynasty the preferred layout for ostraca with marks seems to be an arrangement of marks in rows. The marks appear on their own, but almost just as often together with vertical strokes, dots or both. ONL 6298, discussed below, suggests that there may be no meaningful difference between the usage of dots or strokes. Both types of signs appear to be tally marks.

Ostraca with rows of marks without additional signs

Our corpus contains 66 ostraca inscribed with rows of marks without additional signs. Ostraca of this type have been discovered both at the village of Deir el-Medina and the Valley of the Kings. The greater majority of the ostraca are inscribed in black ink, but there are 23 ostraca with marks in red ink, and one ostrakon with marks inscribed in black ink and others in red.⁸⁸ Most of the ostraca in this category (44 instances) do not display a sequence that is known from other documents.⁸⁹

On the remaining 22 ostraca the marks are at least partly in keeping with a fixed, longer sequence. That is certainly the case for O. Ashmolean HO 1114, ONL 6342, ONL 6266, and ONL 6588. The marks on O. Cairo JE 72490, preserved in its entirety, are perhaps written in a semi-fixed order as well. Other ostraca⁹⁰ display shorter strings or clusters of marks from a fixed sequence, or record marks in the same relative position within such a sequence.

Two of the ostraca in this category, ONL 6371 and O. UC 45683, are also inscribed with what is tentatively explained as a depiction of a metal spike.⁹¹ In both cases the presumed spike is of a slightly larger size than the marks, and it is respectively drawn above and below the other marks. If the interpretation of this depiction is correct, the two ostraca could be records of the distribution of metal spikes to a group of workmen (11 in both cases) by a supervisor. Other ostraca without the depiction of a spike could of course have a similar purpose.

There is a possibility that O. Cairo JE 96285 is inscribed with the word *irp* ‘wine’. The reading of this word is highly conjectural, but worth contemplating. Amphorae with wine labels are attested in 18th Dynasty tombs at Deir el-Medina⁹² and so there is *a priori* nothing that contradicts such an interpretation. The document could be a record of the delivery of wine to or by a group of workmen. Other ostraca in this category may similarly record workmen in the context of distribution or delivery of certain commodities.

The meaning of the other ostraca with rows of marks is not immediately clear. Some may be explained in the same way as ONL 6371, O. UC 45683 and O. Cairo JE 96285. It has also been suggested that O. Cairo JE 72490 was an *ex-voto*.⁹³ An administrative purpose is particularly plausible for ostraca with marks that are arranged in accordance with a sequence

⁸⁸ In four instances no details are known about the use colour.

⁸⁹ O. Ashmolean HO 1100; O. ARTP 02/236; O. Brock 27; O. Cairo CG 25321; O. Cairo JE 72492; O. Cairo JE 72494; O. Cairo JE 72498; O. Cairo JE 96285; O. Cairo JE 96590; O. Cairo JE 96591; O. Cairo JE 96601; O. Cairo JE 96603; O. Cairo JE 96650; O. Cilli 278; O. KV 10002; O. KV 10012; ONL 6194; ONL 6210; ONL 6216; ONL 6260; ONL 6293; ONL 6316; ONL 6331; ONL 6365; ONL 6370; ONL 6402; ONL 6407; ONL 6410; ONL 6423; ONL 6424; ONL 6443; ONL 6454; ONL 6461; ONL 6565; ONL 6568; ONL 6579; ONL 6601; O. Parker H 5; O. Strasbourg H 193; O. UC 45683; O. WV 1; O. WV 8; O. WV 9; O. WV 11; and O. WV 12.

⁹⁰ O. Cairo JE 72490; O. Cairo JE 96630; O. Cairo JE 96631; O. KV 10004; O. KV 10010; O. MMA 09.184.786; ONL 6302; ONL 6339; ONL 6371; ONL 6400; ONL 6416; ONL 6444; ONL 6465; ONL 6600; OL 6789; O. Parker H 7; and O. UC 45708.

⁹¹ See below, p. 159.

⁹² E.g. tomb DM 1156, see Bruyère, *Rapport 1928* II, 34.

⁹³ See above, p. 140.

attested elsewhere. They may be lists of workmen that were present at the worksite at a particular day.

Ostraca with rows of marks and with vertical strokes

The corpus contains seven ostraca of this kind, found both at the village as well as the Valley of the Kings. Three of these ostraca do not seem to have been written in accordance with a sequence,⁹⁴ the other four at least partly so.⁹⁵ The vertical strokes are added below the marks,⁹⁶ underneath or to the right,⁹⁷ or above, to the right or to the left.⁹⁸ In virtually all ostraca, the marks are either accompanied by one or by two marks. The exception is perhaps ONL 6354, where on one of the sides a row of five vertical strokes are inscribed, but it is not clear if they belong to a specific mark or not. The strokes are generally written in the same colour of ink as the marks, apart from O. Ashmolean HO 892. There, the strokes are inscribed in black ink whereas the marks are written in red. This could be an indication that the strokes were added at a later point.

The meaning of these ostraca is unclear. One would expect the ostraca with marks written according to a sequence to be related to the official tomb administration, but we are unable to determine what is tallied. It is problematic to explain ostraca with strokes as accounts of the distribution of rations among the workmen, because in five ostraca (O. Ashmolean HO 892, ONL 6345, ONL 6346, ONL 6489, and O. Varille 423) there are several marks that are not accompanied by any strokes. It seems unlikely that some workmen were not paid at all. In addition, we do not recognise a distribution of the strokes in accordance with ranks: marks with one or with two strokes are attested both at the beginning, the middle and the end of a sequence of marks. Still, this explanation cannot be excluded, especially because we have no knowledge of the provision of the workmen during the 18th Dynasty. It is also possible that these ostraca record the individual output of a workman during a day's work, individual presence or absence during a specific timeframe, or the consumption of a certain commodity by individual workmen.

Ostraca with rows of marks and with dots

There are 26 ostraca with marks arranged in rows that are accompanied by dots. These ostraca originate both from the Valley of the Kings as well as from the village of Deir el-Medina. The dots on the ostraca in this category are often added underneath the marks (six ostraca), but they occur in several other positions as well.⁹⁹ The great variety suggests that the exact position of the dots was hardly relevant to the scribes of these ostraca.

Thirteen ostraca are completely or partly inscribed with a sequence of marks that is attested on other documents.¹⁰⁰ The marks on O. WV 4 are not ordered in such a way, but the marks are clearly related to an existing order. Whether the marks of ONL 6401 adhere to a sequence is unclear. Most of the ostraca contain one or two dots per mark. 11 Ostraca are not

⁹⁴ ONL 6346; ONL 6489 and O. WV 2.

⁹⁵ O. Ashmolean HO 892; ONL 6354; ONL 6514; and O. Varille 423.

⁹⁶ O. Ashmolean HO 892; ONL 6354; ONL 6346; and ONL 6489.

⁹⁷ O. Varille 423 and O. WV 2.

⁹⁸ ONL 6514.

⁹⁹ On other ostraca, the dots are positioned above the marks (two ostraca), to the left the marks (one ostraca), to the left and underneath the marks (one ostraca), over the marks (one ostraca), over and underneath the marks (one ostraca), above and underneath the marks (two ostraca), above and to the right of the marks (one ostraca), right and underneath the marks (one ostraca), above, underneath, and to the left of the marks (one ostraca), above, underneath, to right and left of the marks (eight ostraca), and surrounding the marks (one ostraca).

¹⁰⁰ O. Cairo CG 24107; O. MMA 09.184.700; OL 6788; ONL 6372; ONL 6405; ONL 6509; ONL 6562; O. Stockholm MM 14130; O. UC 31988; O. UC 45709; O. WV 3; O. WV 10; and O. WV 13.

inscribed with an order of marks that is in accordance with an attested sequence, but the dots appear to function in the same way: they are most often added in ones or twos, but occasionally in larger quantities.¹⁰¹

On most ostraca the dots are inscribed in the same colour as the marks are, but there are exceptions in which the dots are added in a different colour.¹⁰² The inscriptions on O. Stockholm MM 14130 and O. WV 10 are a more complicated matter. The latter ostrakon contains both a series of red marks and a series of black marks. The black marks are accompanied by black dots exclusively, and the red marks by both red and black dots. It would therefore appear that the red marks with red dots were inscribed at an earlier phase, and the black marks with black dots at a second stage. At this point black dots may have been added to the red marks as well. We may propose a similar scenario for O. Stockholm MM 14130, inscribed with black marks exclusively. The black dots added to the marks are fine points added with the tip of a pen. They could have been added at the same moment the marks were inscribed. The red dots on the other hand are mostly far thicker. They are large blobs of ink, and in most cases they are visibly added over one or two earlier black dots. These red additions could be either check marks or corrections.

On O. MMA 09.184.700 and O. Cairo JE 72450 a single mark is accompanied by a single dot, which could be nothing else but a check mark left by the scribe when he revised his inscription. On O. WV 4 and ONL 6529 we appear to be dealing with check marks as well. That is suggested by the fact that a different colour of ink is used for the dots, and that dots are added inside or over the marks. In analogy with these documents, ostraca with marks accompanied by a single dot each (ONL 6401; ONL 6499) or with some marks with a single dot next to it (O. KV 10011; OL 6788; ONL 833; ONL 6340; ONL 6405; ONL 6510; O. WV 3; O. WV 13) could be similar records in which the scribe ticked off the marks as he went through his document to double check the account.

On four ostraca each mark is accompanied by either one or two dots,¹⁰³ and in two ostraca either one or two dots are added to almost every single mark.¹⁰⁴ These documents may well be similar to ostraca with marks with one or two strokes added to them. But besides these ostraca we encounter in this category marks with a larger number of dots. The ostraca in question may well be different from ostraca with single dots, or with one or two dots added to particular marks. The distinction is based on the facts that in ostraca with larger quantities of dots, there are no marks without any dots. We count two or three dots per mark (O. WV 6), one, two or three dots (ONL 6372), one to four dots (O. UC 31988), around seven dots (ONL 6646), between one and nine dots (ONL 6486), and between one and nineteen (O. Cairo CG 24107).

Because the 18th Dynasty ostraca with marks are typically implicit about their content, it is unclear what the meaning of the dots is exactly. It seems evident that among the ostraca in this category there are documents that deal with the crew of workmen in its entirety, such as OL 6788, O. Stockholm MM 14130 and O. WV 3. These and other ostraca record the marks in a semi-fixed order. This suggests they are records of the collective tomb administration. Evidence of the revision of documents and of check marks points in the same direction. Still, it is not clear what it is that the dots are counting. Single dots could be check marks. There seems to be a distinct subcategory of ostraca with marks accompanied by either one or two dots. We recognise this type of documents from the category of marks with

¹⁰¹ O. BTdK 833; O. Cairo JE 72450; O. KV 10011; ONL 6223; ONL 6340; ONL 6486; ONL 6499; ONL 6520; ONL 6529; ONL 6646; and O. WV 6.

¹⁰² Black marks and red dots: O. Cairo JE 72450; ONL 6510; red marks and black dots: ONL 6529; O. UC 45709; O. WV 4.

¹⁰³ ONL 6509; ONL 6562; O. UC 45709; O. WV 10.

¹⁰⁴ ONL 6223; O. Stockholm MM 14130.

vertical strokes. Some of these documents, as well as the ostraca with marks and greater number of dots could be accounts of the distributions of rations. Yet we cannot exclude the possibility that documents record the output of labour on the tomb, but they could record something entirely different.

Ostraca with rows of marks and with vertical strokes and dots

Only a small number of the ostraca with marks arranged in rows are inscribed with both vertical strokes and dots. Three were discovered in the village and one was found in the Valley of the Kings. Two ostraca¹⁰⁵ are written in a meaningful, ordered sequence that is attested on other documents, and seem to record the complete workforce. A meaningful sequence is not detected in the other two ostraca.¹⁰⁶ In one ostrakon (O. Cairo CG 24105) the marks and additional dots and strokes are of the same colour, but in the other three ostraca both black and red ink is used.

O. Cairo CG 24105 is also different in that it records marks with either dots or strokes. In fact it is only the first mark of the sequence that is accompanied by strokes. It is possible that the strokes record the exact same thing as the dots. The scribe may have simply continued with dots in the rest of the document after a short break.

The reverse of ONL 6348 displays two marks without dots or strokes, but the obverse is different. It is inscribed in black ink with three marks: one mark has three red dots; one mark has three strokes and one dot; and the last mark has one dot and one stroke. The colour difference clearly indicates that the dots and strokes were added after the marks were inscribed. Whether there is a difference between dots and strokes is difficult to determine, but that need not be the case.¹⁰⁷

In contrast, the dots and strokes on ONL 6286 are added in both red and black ink, while all marks are black. One vertical stroke is inscribed left of mark ⤴, and what are perhaps three short strokes are situated below mark ⤴. The meaning of the red signs, assumedly added at a later point, is unclear. A single black dot is added to one mark, one or two vertical strokes are added to others, and one mark is accompanied by two short horizontal strokes. Again we do not know if there is a difference between these signs.

However, ONL 6289 suggests that dots and strokes signify the same thing: they are tallies that represent a quantity that is connected with a specific workman. This quantity can be conveyed with dots, vertical, horizontal and even diagonal strokes. Although dots and strokes of different quantities, shapes and colours are combined (e.g. a single mark accompanied by one black vertical stroke, one red vertical stroke and one red dot), the shape of the strokes is always consistent per mark. For example, above mark ▯▯ one black diagonal stroke and two red diagonal strokes were added, but there are no instances of marks with vertical as well as horizontal strokes. The quantities in horizontal, vertical and diagonal strokes also suggest that they do not mean something different: per colour they are added as a single stroke, or in pairs or triples. Hence the total number of strokes never exceeds six regardless of their shape. On ONL 6289 the dots seem to be tally marks, just as the strokes are. We come to that conclusion because the number of dots inscribed in a particular colour is never larger than three, like the strokes. Moreover, it is often difficult to distinguish dots from a very short stroke, indicating that the scribe did not make an effort to differentiate between dots and strokes. Together, the dots and strokes of both colours seem to convey a quantity between one and six for each recorded workman on ONL 6289. The marks on this ostrakon are all written in black ink and seem to have been inscribed in one go. Black dots and strokes would seem to have been added to the marks at the same moment and red strokes may have

¹⁰⁵ O. Cairo CG 24105 and ONL 6298.

¹⁰⁶ ONL 6287 and ONL 6348.

¹⁰⁷ Compare ONL 6289 below.

been added at a later point, in the sense that the document may have been reused for another administrative round.

The evidence thus leads us to believe that dots and strokes were employed in the same way. It is nevertheless still unclear what the tallies represent. In the ordered list of O. Cairo CG 24105 there is no proof of an arrangement according to rank, in which the workmen at the beginning of the sequence are the recipients of larger portions than the workmen further down the sequence: mark \sqcup (position 1) is connected with seven strokes; mark \wp (position 2) is connected with perhaps six dots; but mark \wp (position 6) is connected with 14 dots. In contrast, the list of ONL 6298 may have been arranged in accordance with the rank or rather seniority of the workmen.¹⁰⁸ The sequence opens with \wp , identified as the mark of foreman Kha. His mark is accompanied by a total of six strokes, while the other individuals recorded in the list of ONL 6298 are associated with a smaller quantity. The figures connected with the marks in positions 2 – 6 are relatively high as well (three or four).

If the idea that strokes and dots are essentially the same sort of tally marks is valid, then the ostraca in this category are probably no different from the ostraca in the categories discussed above. ONL 6298 and O. Cairo CG 24105 appear to record the entire workforce and are in all likelihood documents of the collective administration. One would expect them to deal with matters such as the output of labour, absence or presence at the worksite, or the distribution of goods. ONL 6287 and ONL 6348 could in theory record private matters as well.

2.3.4.3 Ostraca with marks in compartmented sections

Ostraca of this sort are exceedingly rare during the 18th Dynasty. We know of two examples from the village and one from the Valley of the Kings. The best preserved and clearest instance of this document type is ONL 6643. At least nine marks are inscribed in compartmented sections, demarcated by black lines. Each mark occupies a rectangular space. Below each mark a series of vertical strokes are inscribed, sometimes accompanied by one or two dots as well. Like the dots in the ostraca of the previous category, the meaning of the dots on ONL 6643 is not quite clear. They may not be any different from the vertical strokes. Indeed, some of the dots could in fact be very short strokes. Other dots are very faint and small, and were perhaps made by the scribe when he recounted the strokes he had added below each mark. The number of strokes ranges between one and seven, and are probably tally marks. It has been pointed out above that the marks are probably inscribed in accordance with their relative position in the sequence of OL 6788, which speaks in favour of an interpretation of ONL 6634 as an administrative tomb record.

ONL 6692 is a similar ostrakon but is preserved in a far less favourable state and therefore it cannot be properly compared. No dots or strokes seem to have been added to the marks, which in turn are apparently not inscribed in accordance with any known sequence. The document is therefore not necessarily a record of the collective administration. Still it is possible that dots and/or strokes were to be inscribed at a later moment.

Mention should here be made of O. BTdK 832, the date and meaning of which are far from but clear. The layout of this ostrakon is rather dissimilar to the other ostraca. Here, wavy lines are drawn between the assumed marks, perhaps to create compartmented sections in order to separate series of dots added to one mark from the dots added to the next.

2.3.4.4 Ostraca with marks not arranged in rows or columns

Ostraca with marks not in rows or columns without additional signs

¹⁰⁸ More on this matter, see below, 2.6.5.

Of the 18 ostraca in this category six were discovered in the Valley of the Kings. The remainder was found in the village of Deir el-Medina. As one might expect, the disordered scattering of marks over the surface of the ostrakon means that the scribe did not organise the document in accordance with a specific order of marks. However, the influence of such a sequence is still recognisable in O. WV 5 and ONL 6203, and could indicate that these ostraca were made as part of the collective tomb administration. The other 16 ostraca¹⁰⁹ may well have been similar documents. It is conceivable that they are brief notes of attendance of individual workmen at the worksite on a specific day. However, they may just as likely be unrelated to labour. For all we know such ostraca represent private accounts listing individuals involved in a certain transaction. Particularly ostraca with smaller numbers of marks are more likely explained in this way.

Ostraca with marks not in rows or columns and with vertical strokes

We possess four ostraca in which marks, scattered over the surface, are accompanied by vertical strokes. Three ostraca originate from the village and one ostrakon was found in the Valley of the Kings. In each document one colour of ink is used for the marks as well as the strokes. Unsurprisingly, the marks on two ostraca¹¹⁰ do not adhere to a semi-fixed sequence attested elsewhere, but in the two other ostraca¹¹¹ this may indeed be the case. The strokes that accompany the marks are situated at various positions. They are added above the marks,¹¹² underneath the marks,¹¹³ to the right or left of the marks,¹¹⁴ and above, underneath or to the right of the marks.¹¹⁵ The account on O. Cairo CG 24108 appears to have undergone a lot of revision. Dark smudges surrounding several marks indicate that several marks were deliberately erased by the scribe, and the ostrakon may have been reused.

On ONL 6504, each mark seems to be accompanied by either one or two strokes. The other ostraca display greater numbers of strokes. On O. IFAO C 1298 only a single mark is accompanied by a total of three strokes, but the ostrakon is very fragmentary. It is unclear if strokes were added to the other marks too. On ONL 6544 – likewise fragmentary – two marks are accompanied by four and by five strokes. On O. Cairo CG 24108 between two and six strokes are added to the marks.

There are no reasons to believe that the strokes in this category of ostraca are any different from the strokes added to marks that are neatly arranged in rows. Therefore the purpose of ostraca with marks not arranged in rows or columns accompanied by vertical strokes is probably similar as well: they could be accounts of the delivery or distribution of goods among the members of the workforce, overviews of the days of work recorded for individual workmen, or documents that are directly related to the progress of the work on tomb. Unfortunately the evidence does not point to a particular direction. The large number of marks on O. Cairo CG 24108 suggests that it must have been a document of the collective tomb administration. That cannot be said of the other three fragmentary ostraca, and they could theoretically be private accounts as well.

¹⁰⁹ O. Cairo JE 96585; O. Cairo JE 96587; O. Cairo JE 96606 B-C; O. Cairo CG 25327 bis; O. MMA 09.184.770; ONL 6207; ONL 6214; ONL 6307; ONL 6341; ONL 6362; ONL 6415; ONL 6457; ONL 6475; ONL 6564; ONL 6589; and ONL 6608. Note that the date of ONL 6589 and ONL 6608 is uncertain.

¹¹⁰ O. Cairo CG 24108 and O. IFAO C 1298.

¹¹¹ ONL 6504 and ONL 6544.

¹¹² ONL 6544.

¹¹³ O. IFAO C 1298.

¹¹⁴ ONL 6504.

¹¹⁵ O. Cairo CG 24108.

Ostraca with marks not in rows or columns and with dots

The five ostraca that constitute this category have all been found at the village of Deir el-Medina. It does not follow that this particular document type is specific for this location, because the ostraca within this group are quite different from each other. We observe that the dots are added below the marks,¹¹⁶ to the right of the marks,¹¹⁷ to the right and left of the marks,¹¹⁸ above, to the right and left of the marks¹¹⁹ and over the marks.¹²⁰ In all cases the marks and dots have been written in the same colour of ink, except for ONL 6349. On the latter ostrakon charcoal is used to inscribe the marks, and a single small red dot has been added next to one of them. It is unclear if it is meaningful, and it could have been left by a scribe – the original scribe or a second individual – that revised the document and let his pen rest next to one of the marks whilst counting the total of marks on the ostrakon.

Despite a rather disorganised arrangement of the marks on most of the ostraca of this category, O. Turin N. 57310 and ONL 6305 do appear to have been composed by an individual who was familiar with the fixed order of workmen. On the former ostrakon a single dot appears to have been added to each mark, in the latter the number of dots is higher. It is unclear if each mark received a series of dots, but the number of dots that is attested per mark ranges from one to four.

The marks on ONL 6272, ONL 6349 and ONL 6516 do not appear to follow a specific order. Whether the dot on ONL 6349 is meaningful is uncertain. In ONL 6272 a large dot was added on top of each mark. We may assume they are check marks, added by a scribe who used the original inscription on the ostrakon as a list of a group (or perhaps all) workmen, and then crossed them off at some point. It is therefore conceivable that the ostrakon was used during the distribution of goods. Alternatively the ostrakon could be a checklist employed at the beginning of a workday to record the men that were present at the site. Regarding ONL 6516 it is not clear if each mark was accompanied by dots, but the preserved marks display two and six marks.

Again it would appear that there is no reason to suspect that the ostraca with marks that are not arranged in rows are any different from ostraca with marks that are. In both categories we recognise documents that adhere to a particular sequence, and documents that do not, and in both categories we encounter dots that may be check marks, and dots that are probably tally marks. The five ostraca mentioned in this section presumably served the same purpose as those discussed above.

Ostraca with marks not in rows or columns and with dots and strokes

This category of ostraca contains but two pieces, one from the Valley of the Kings,¹²¹ the other from the village.¹²² Whereas the latter ostrakon may be related to the sequence of O. Cairo JE 96650, the marks on the former ostrakon appear to have been distributed over the surface of the ostrakon at random. ONL 6630 is very fragmentary and therefore difficult to interpret. Four (plus more?) and six vertical strokes are positioned underneath two marks respectively. Up to five dots are visible above these marks but it is not quite certain if they too were added to a workman's mark.

O. Cairo CG 24106 is preserved in its entirety, but grasping the meaning of the document is no less difficult. The strokes and dots feature mostly right of the marks but also

¹¹⁶ O. Turin N. 57310.

¹¹⁷ ONL 6349.

¹¹⁸ ONL 6516.

¹¹⁹ ONL 6305.

¹²⁰ ONL 6272.

¹²¹ O. Cairo CG 24106.

¹²² ONL 6630.

left of and underneath the marks, as well as above and within the contours of the marks. Some marks are accompanied by dots exclusively, others only by strokes, and three marks by both dots and strokes. As we observed earlier, there are no clear indications that dots and strokes have a distinct meaning, and on O. Cairo CG 24106 too it is sometimes difficult to tell a dot from a small stroke. In the case of marks D and X , where dots are added inside of the contours of the mark, it seems the scribe opted for the usage of dots because of the limited space. It would thus seem that the dots and strokes were both used as tally marks. Combined, the dots and strokes record rather high figures that range between one and 29. It is clear that this ostrakon has been reused. There are smudges of red ink around some of the marks that indicate the deliberate erasure of strokes or dots. The ostrakon would therefore seem to have been adjusted on at least one occasion. This may explain to some extent the difference in the colour of the marks, and of the dots and strokes added to them. We count 15 black marks and 11 red marks. Then there are three marks that were redone in a different colour of ink. It is unclear in which colour these three marks were written in first instance, but we can make a case for black ink. Because there are more black marks than there are red marks, we may for the moment assume that the ostrakon was initially inscribed with black marks, to which red marks were added at a later stage. The colour of the strokes that accompany the marks suggests the same. We notice that there are five, perhaps six marks which have both red and black marks added to them: A , X , B , M , N , O and maybe H . In the case of A , B , M , N and O , the black strokes are situated at the centre of the series of strokes, flanked on both ends by red strokes. It would thus appear that the red strokes were added around the black strokes,¹²³ probably because the red strokes were added at a later stage. By association, the red marks may have been inscribed at the same stage. It could have been at that moment that some of the originally black marks (and some strokes as well) were traced in red ink, because the original black ink had faded. If we now reconstruct the different phases in the ostrakon's usage, we envisage a scribe picking up a piece of limestone to inscribe it with a list of workmen's marks. To these marks he added both strokes and dots, presumably as tally marks. At a later stage, the scribe returned to his document, erasing some dots and strokes. Either then or at a later moment, he added new marks with dots and/or strokes in red ink, and also added some red dots and/or strokes to already existing marks and their tallies. If this reconstruction is correct, then the document records an accumulation of data. It is unknown how much time passed between each phase in the usage of the ostrakon. Since more workmen's marks seem to have been added, we may be dealing with a record of different workdays. The marks of the workmen who were added later may not have been present at the worksite on the day the first marks were inscribed in black ink. As such, O. Cairo CG 24106 could document the individual progress made by the workmen over the course of some days. This remains highly uncertain because it would then be very odd that some tally marks were erased. For this ostrakon to be a record of the accumulated progress of workmen over time, the erased spots have to be explained as mistakes of the scribe or as the remnants of an even older phase of the document.

2.3.4.5 Ostraca with a single mark

There are 26 ostraca that are completely preserved and display nothing more than a single mark, or a double instance of the same mark.¹²⁴ Apart from O. KV 63 (perhaps dating the 18th Dynasty), they were all discovered at the village of Deir el-Medina. These pieces appear to

¹²³ Although one red stroke below mark O seems to have been squeezed in between two black strokes.

¹²⁴ O. IFAO C 1443; O. IFAO C 2503; O. IFAO C 3271; O. IFAO C 7635; O. KV 63; ONL 6198; ONL 6202; ONL 6206; ONL 6326; ONL 6330; ONL 6332; ONL 6333; ONL 6334; ONL 6335; ONL 6336; ONL 6343; ONL 6345; ONL 6352; ONL 6353; ONL 6357; ONL 6363; ONL 6368; ONL 6369; ONL 6390; ONL 6398; and ONL 6403.

form a distinct group, because except for O. IFAO C 3271¹²⁵ they were all inscribed on chips of limestone. A slim majority (15 instances) is inscribed in red ink.

Because each ostrakon is inscribed with a single mark they cannot be documents made for the collective tomb administration. Instead, the objects in this group are similar to so-called name stones. Ramesside name stones from Deir el-Medina are pieces of limestone inscribed with a single name, usually written in hieratic. Their exact purpose is unclear, but they have been explained as countermarks that were to be handed over to the directors of the workforce in exchange for rations or tools. Because the discussion of such ‘administrative objects’ has exclusively focussed on evidence from the Ramesside Period, we will return to this issue in chapter 4.¹²⁶ For now it suffices to state that the evidence for an interpretation of these pieces as countermarks is meagre. The theory cannot be refuted, but it seems equally plausible that these stones were used in the private domain. Frustratingly, the exact findspot in the village has not been recorded for any of the 18th Dynasty ostraca with a single mark. We propose the theory that the stones may have been placed in a certain space, perhaps a house or a store room, to designate its owner. It is also possible that the stones were used as ex-votos in (the construction of) private tombs, religious chapels or domestic shrines.¹²⁷

Ostrakon O. OIM 19206 is also inscribed with a single mark, but it is evidently of a documentary character. It displays mark 𐀀 accompanied by 10 vertical strokes that may or may not tally a workmen’s individual output over the course of a workday.

2.3.4.6 Unclear ostraca

Three ostraca, ONL 6546, ONL 6558 and ONL 6580, are too fragmentarily preserved to analyse.

2.4 SCRIBES AND SCRIBAL COMPETENCE

In section 2.1 it has been demonstrated that the 18th Dynasty ostraca with marks are datable to the period between the reign of Thutmose III and Amenhotep III, and that there are vague indications that some ostraca could have been made after the reign of Amenhotep III. The corpus of 18th Dynasty ostraca as identified in this chapter, including ostraca inscribed with only one mark, consists of 138 examples. This figure is extremely small considering that the timespan between the beginning of the reign of Thutmose III and the end of the reign of Amenhotep III amounts to about 125 years. If we suppose for a second that the 138 ostraca available to us represent only 10%¹²⁸ of the original amount of ostraca that were ever created during this period, that would still mean that c. 12 ostraca with marks were authored every year. The small amount of ostraca with marks is paralleled by the finds of the controlled excavations conducted by the University of Waseda in the area of the workmen’s hut near the tomb of Amenhotep III, which yielded no more than 12 ostraca with identity marks on them. Surely this site was already disturbed before modern excavations took place, but we get the impression that ostraca with marks were not created on a daily basis.

One of the questions we are concerned with in the current section is the chronological distribution of the ostraca, as we wonder if there is a development in the usage of marks and

¹²⁵ It is uncertain if O. IFAO C 3271 is preserved in its entirety and it may be an ostrakon of a different type.

¹²⁶ See chapter 4, 4.3.3.4.

¹²⁷ For possible use of stones with marks as ex-votos, see above, p. 140.

¹²⁸ Cf. an estimation by Janssen, ‘Literacy and Letters’, 85-86; admittedly, this percentage is far from accurate. Janssen’s calculation is based on a group of ostraca recording deliveries and duty rosters from a very specific period in the history of the written administration of Deir el-Medina: years 24 – 31 of Ramesses III; the ostraca in question do not appear to be representative for the entire Ramesside Period. In fact, ostraca composed with marks suggest that after year 2 of Ramesses IV the hieratic scribe responsible for this specific type of documentation discontinued the practice, while a different individual carried on producing records of deliveries and the duty roster using marks, see chapter 3, 3.3.20.

the production of ostraca. This question is, however, problematic. It has been discussed that there may well exist an archaeological bias in the material available to us, but it is difficult to assess its severity and we are unable to compensate for it. We may only look at the data as they present themselves to us and draw tentative conclusions from it. Excluding ostraca of which the date is unclear, as well as ostraca inscribed with a single mark only, the chronological distribution of ostraca is as follows:

Group A:	Thutmosis III	4 + 10 attributed ostraca	14
Groups A-B:	Thutmosis III – Amenhotep II	2 attributed ostraca	2
Group B:	Amenhotep II	5 + 11 attributed ostraca	16
Groups B-D:	Amenhotep II – Amenhotep III	5 attributed ostraca	5
Group D:	Amenhotep II – Amenhotep III	5 + 9 attributed ostraca	14
Groups D-C:	Amenhotep II – Amenhotep III	12 attributed ostraca	12
Group C:	Amenhotep III (and later?)	12 + 48 attributed ostraca	60

The blocks consisting of ostraca attributed to groups B-D, D and D-C contain most probably ostraca that were inscribed during the reign of Thutmosis IV, but it is very difficult to identify which ostraca exactly. Because the groups between group B and group C are not very accurately dated, the overview makes somewhat more sense when the intermediate groups A-B, B-D and D-C are seen separately from the ostraca attributed to the four core groups:

Group A:	14 ostraca	Group A-B:	2 ostraca
Group B:	16 ostraca	Group B-D:	5 ostraca
Group D:	14 ostraca	Group D-C:	12 ostraca
Group C:	60 ostraca		

A slight increase in the number of ostraca in the core groups is visible, and the same development appears to take place in the ostraca in the intermediate groups. The larger number of ostraca towards the later part of the 18th Dynasty could be due to archaeological circumstances. Moreover, we do not know exactly how far group C extends beyond the reign of Amenhotep III. On the other hand, the growing frequency of ostraca with marks is understandable in the light of the increased number of workmen.¹²⁹ More workmen will probably have meant more labour, and therefore more administration. Apart from the documentation of activities at the worksite, the infrastructure of the provision of an increased number of workmen¹³⁰ would also have become more challenging, which could have caused the necessity for more administrative documents. An even simpler reason is that a larger group of workmen would be able to generate a greater number of ostraca.

Certainly, there are indications that the ostraca from the 18th Dynasty were not all created by a single individual. That becomes quite evident when the handwriting of the documents is compared, which display many different hands. Some insights into the palaeography of the 18th Dynasty ostraca will here be offered, but it must be explicated from the onset that they do not follow from extensive palaeographic research. They are mere suggestions that deserve to be elaborated in future research. It is therefore with some reservations that we propose to identify the scribe of O. WV 3 (FIG. 4) with that of OL 6788 (FIG. 5) on the basis of the similarity of the marks. Two other ostraca with a very similar sequence, O. Stockholm MM 14130 (FIG. 6) and ONL 6298 (FIG. 7) cannot date far apart from O. WV 3 and OL 6788, yet seem to have been made by different scribes. What is more, the

¹²⁹ See below, 2.6.6.

¹³⁰ As can be surmised from the total number of identity marks on completely preserved ostraca, see below, 2.6.6.

hand of O. Stockholm MM 14130 is not evidently the same as that of ONL 6298. If these tentative remarks are correct, there would have been at least three more or less contemporaneous individuals who created ostraca with marks during the reign of Amenhotep III.



FIGURE 4. DETAILS OF O. WV 3



FIGURE 5. DETAILS OF OL 6788



FIGURE 6. DETAILS OF O. STOCKHOLM MM 14130



FIGURE 7. DETAILS OF ONL 6298

In support of this view is O. WV 10, which displays two lines of marks that must have been written by two different persons (FIG. 8). The handwriting of the marks in the upper line is very refined. The shapes of the marks borrowed from hieroglyphic script such as 𓂏 , 𓂐 and 𓂑 , are elegant and well balanced. Although written in a few quick strokes, they display fine details, such as the hand in mark 𓂐 and the horns of the viper in mark 𓂑 . The marks are all approximately of the same height and width, and the strokes were made in a steady hand. The marks are all more or less horizontally aligned. Two flat but broad signs 𓂒 and 𓂓 are written one above the other to create an evenly spaced square, as would have been done by a hieroglyphic scribe. The inscription has all the hallmarks of someone who was trained in drawing hieroglyphs. In contrast, the marks in the second line appear to be the work of a different man who was not professionally trained as a scribe. His marks are larger, written in thicker, sloppier strokes. His lines are not very fluid or straight but rather squiggly. The marks themselves are not all of an even size, and they are less well aligned. The ductus and shape of mark 𓂔 is not evidently hieroglyphic. This contrast demonstrates that two different men had used the ostracon, seemingly to create a single document.¹³¹

¹³¹ O. MMA 09.184.700 was inscribed by two different individuals as well, perhaps by the same two men who created O. WV 10.



FIGURE 8. DETAILS OF O. WV 10

Hence there are reasons to assume that several contemporaneous individuals occasionally took to writing ostraca with marks. Nevertheless, some men may have done this more often than others. A cursory comparison of the shape of marks on other ostraca to the handwriting of the scribe that authored O. WV 3 and OL 6788 suggests that the same man also made O. WV 1, O. WV 8, the red marks on O. MMA 09.184.700 and perhaps the upper line of marks in O. WV 10. Likewise, it seems probable that the four ostraca found near the tomb of Amenhotep II (O. Cairo JE 24105 – 24108) were created by the same man. O. Cairo JE 96630 and O. Cairo JE 96631, found together as well, also seem to have been made by a single same hand. Additionally it is proposed that O. Cairo JE 72490 and O. Cairo JE 72494 were made by one individual, and it seems likely that O. Strasbourg H 193, ONL 6302 and O. Cairo JE 96285 can be assigned to yet another scribe.

It is very difficult to make any statements about the identity of the persons that created the ostraca with workmen's marks, because we barely have data about any of the individuals that worked in the royal tombs of the 18th Dynasty.¹³² The evidence does allow us to offer some general remarks. To begin with, there are no indications that scribes trained in hieratic script were involved in the composition of documents with marks. That is suggested by the fact that nothing in the layout, style, and content of the ostraca is reminiscent of hieratic. Whereas ostraca from the Ramesside Period occasionally combine marks with hieratic numerals and other hieratic signs, no hieratic is found in the documents available to us. Similarly, no hieratic ductus is evident in any of the marks on the 18th Dynasty ostraca, which stands in contrast to the Ramesside ostraca as well. It is clear that the corpus of 18th Dynasty marks includes several specimens that are borrowed from hieroglyphic script, such as 𓂏, 𓂐, 𓂑, 𓂒, 𓂓, 𓂔, 𓂕 and 𓂖. None of these marks occur in a hieratic variant. On the contrary, numerous marks are written in a (cursive) hieroglyphic ductus. The only exception is perhaps mark 𓂗, and its allomorph 𓂘, which may or may not have been a hieratic variant of mark 𓂙, interpreted as Gardiner sign Q3 with the phonetic value *p*.¹³³ Yet, even the single inscription on a 18th Dynasty ostrakon that may be textual has been written predominantly with signs that occur in hieroglyphic script.¹³⁴

If the 18th Dynasty ostraca were not made by professional hieratic scribes, the question arises if the individuals that did create them were literate, and if so, to what extent. This is a very complicated issue and there is not enough data to provide a comprehensive answer. It

¹³² See chapter 1, 1.3.1; 1.4.1.

¹³³ See p. 89, ONL 6461 and p. 106, ONL 6465.

¹³⁴ O. Cairo JE 96285.

can be pointed out that the layout of several ostraca is of such a disorganised nature that one would not expect them to have been made by someone thoroughly familiar with scribal practices. Ostraca from the 18th Dynasty with series of marks appear generally in two different formats. Most frequent are documents with horizontal lines of marks. In the other type marks are not arranged in rows or columns, but are distributed – seemingly – at random over the available surface of the ostrakon. It has also been remarked above that there are several ostraca in which the marks are written along the contours of the ostrakon.¹³⁵ In addition there are ostraca which are written in *boustrophedon*.¹³⁶ These ways of recording information are far removed from formal Egyptian writing practices. It seems very unlikely that a scribe who was educated as a hieratic scribe, or a draughtsman who was accustomed to drawing columns and registers of hieroglyphic texts on the walls of tombs would have chosen to jot down marks randomly over the surface of an ostrakon. It would also be odd for such individuals to write series of marks in *boustrophedon* or around the contour of an ostrakon. Instead, these are the methods that would have been employed by an individual who was not instructed in the craft of writing and who must have been less familiar with scribal conventions.

An example of such an individual would appear to be the person who created ostraca O. Cairo CG 24105 – 24108. In these four ostraca we discern three different ways of arranging marks: scattered throughout the document; following the contour of the ostrakon; and in lines written in *boustrophedon*. Such heterogeneity is paralleled by the (seemingly) arbitrary usage of dots and strokes as tally marks. Moreover, the many differences in the orientation of marks, as well as the great variability in the exact shape of marks¹³⁷ gives the impression that the author of these ostraca had not been instructed in scribal practices. His documents contain so many inconsistencies that it appears that he composed these ostraca without a preconceived strategy, being insufficiently familiar with the conventions of hieroglyphic and hieratic script.

Conversely, the scribe who wrote the upper line on O. WV 10 as well as several other ostraca with marks appears to be far more acquainted with hieroglyphic script. We had already deduced this from his neat handwriting and from the hieroglyphic appearance of his marks. But it follows also from the fact that all of his marks are orientated to one direction. Granted, in OL 6788 the marks are all orientated to the right whereas this document was written from left to right, but we observe a uniformity in the marks, not only in the horizontal but also in the vertical sense. None of the marks are written upside down. This is also noticeable in the upper line of O. WV 10, where the marks all face the right side and none are inverted. In contrast, the lower line of this ostrakon, written by a second person, contains a mark on its side (⊕), an inverted mark (⊞) and a diagonally inscribed mark (×). Returning to the scribe who created OL 6788 and other pieces, we had already noticed that he was in the habit of grouping two broad and flat signs together.¹³⁸ This is a strong indication that he was familiar with the visual conventions of hieroglyphic script. He must have possessed a stronger sense of the orientation of the marks, and an affinity for aesthetic grouping of marks. Were one to guess what the occupation this member of the crew of necropolis workmen may have been, then the position of draughtsman seems most probable.

¹³⁵ O. Cairo CG 24105; O. Cairo CG 25321; O. Cairo JE 72450; O. Cairo JE 72490 and perhaps ONL 6370.

¹³⁶ O. Cairo JE 72490; O. Cairo CG 24105; O. Cairo CG 24107; and O. Stockholm MM 14130.

¹³⁷ Well illustrated by the marks discussed above, 2.2.2.

¹³⁸ Examining the sequence of marks of OL 6788, it seems plausible that the order was not entirely based on the rank of the workmen referring to it, as suggested below, 2.6.5, but partially on aesthetic grounds too. It is noteworthy that all broad and flat signs are situated in adjacent positions so that the scribe could stack one above the other and form visually appealing squares. Similarly, it may not be a coincidence that the narrow tall signs 𓄿 and 𓄿 are found next to each other.

This man was undoubtedly not the only draughtsman to have created ostraca with marks. We can probably identify the author of O. Cairo JE 72490 and O. Cairo JE 72494 with a draughtsman who was active during the reign of Thutmose III. At any rate that is suggested by the appearance of the marks, which are written in a fine, well balanced hand. The scribe had an eye for detail, and his rendering of mark  with short thin lateral branches is most elegant. He is also the only scribe that added two thin horizontal lines within the contours of the basket in mark . On the other hand, it would appear that O. Cairo JE 72490 was written in *boustrophedon*, despite the scribe's assumed familiarity with hieroglyphic script. Moreover, mark  has been written upside down.¹³⁹ We are therefore cautioned not to rely solely on the orientation of marks and their particular arrangement on a document when attempting to evaluate a scribe's background.

An extensive palaeographic analysis may be able to identify more traits of draughtsmen who composed ostraca with marks during the 18th Dynasty, but there is no space for such an endeavour in the current work. It will have to suffice that based on considerations described in the previous paragraphs, there are 23 ostraca¹⁴⁰ and perhaps seven more,¹⁴¹ in which we detect the hand of someone who had been trained to draw hieroglyphs. Out of a total of 138 ostraca this group represents c. 20% of all 18th Dynasty ostraca available to us. Of course this figure is merely an estimate, but it suggests that the greater majority of ostraca were made by workmen who were not trained in writing hieroglyphic or hieratic signs.

2.5 THE MARKS FROM THE TOMBS OF DEIR EL-MEDINA

As we have seen in the previous chapter, the identity marks of the 18th Dynasty workmen are attested in tombs in the Eastern and Western Cemeteries of Deir el-Medina that were dated to the 18th Dynasty by Bruyère.¹⁴² While the marks corroborate Bruyère's general date, it is not certain if his more precise attributions agree with the dates assigned to some of the workmen's marks. The hesitation is caused by the fact that the assemblages from the tombs are difficult to interpret. A date for three tombs in the Eastern Cemetery (tombs DM 1370, DM 1379, and DM 1388) in the reign of Hatshepsut or Thutmose III is suggested by amphorae that bear the cartouches of these rulers. But technically these finds only serve as a *terminus post quem*, because the vessels may have been reused. Likewise the sets of marks attested within a single burial are difficult to date because they are not necessarily contemporaneous. The mark on a particular item may have belonged to the owner of the tomb, while the marks on other objects may refer to workmen of one or two generations later who donated gifts to the funerary equipment of the deceased.

Inferring a date from the finds is therefore problematic. Take for example tomb DM 1370, attributed to the reigns of Hatshepsut – Thutmose III (TABLE 17). First of all we have to admit that we have no clear indications of the repertory of marks from the period prior to Thutmose III. It is possible that workmen's marks were in use around that time, but there are no unambiguous indications for us to assume so.¹⁴³ Turning to the two attested marks, we encounter , which is securely attested in group A, associated with the reign of Thutmose III. Mark  on the other hand is characteristic for group C and the time of Amenhotep III. It

¹³⁹ The mark is not recognisable as a hieroglyph and therefore it is not clear what its top and bottom are, but because the mark is most frequently attested as , it seems that this would be its correct orientation.

¹⁴⁰ O. Ashmolean HO 892; O. Cairo JE 72490; O. Cairo JE 72492; O. Cairo JE 72494; O. Cairo JE 96285; O. MMA 09.184.700; O. MMA 09.184.786; OL 6788; ONL 6194; ONL 6210; ONL 6266; ONL 6302; ONL 6410; ONL 6423; ONL 6461; ONL 6565; ONL 6588; ONL 6601; O. Strasbourg H 193; O. WV 1; O. WV 3; O. WV 8; and O. WV 10.

¹⁴¹ O. IFAO C 7635; O. KV 10004; ONL 6333; ONL 6335; ONL 6410; ONL 6646; and O. UC 45709.

¹⁴² See chapter 1, 1.5.

¹⁴³ Compare preliminary observations in Soliman, 'Workmen's Marks in Pre-Amarna Tombs' (forthcoming), § 4.3.

could be that mark X was in use as a mark at the time of Hatshepsut, but it is also possible that the date of the tomb is incorrectly based on the royal names on the amphorae.

Tomb	Attested names	Date	Marks
1370	<i>mdz(...)</i>	Hatshepsut – Thutmose III	X; †
1379	- <i>nbw</i> - <i>ibnttn {s3}.t</i> <i>nḥm.tw ?</i> - ... <i>s3.t n <ḥ> m ?</i>	Hatshepsut – Thutmose III	ʃ; †
1388	<i>s3.t-r^c</i>	Thutmose III; “year 26”	⊕; ⊖ ¹⁴⁴ ; ʃ; ʃ; ⊕; ⊕; ⊖; ⊕ ¹⁴⁵

TABLE 17. MARKS ATTESTED IN TOMBS DM 1370, 1379 AND 1388 IN THE EASTERN CEMETERY

Two other mortuary assemblages from the Eastern Cemetery present similar dilemmas. The five marks from DM 1388 are all attested in group C (taking mark λ as an allomorph of ʃ), while marks ⊕ and λ are not attested in the reign of Thutmose III. Yet, an amphora from the same burial dates to that very reign. The two marks from DM 1379 are both attested in group B, the ostraca related to the reign of Amenhotep II. It is unlikely that the workmen with these marks were already active at the time of Thutmose III.

The situation is not much different in the Western Cemetery. Groups of marks attested in particular burials are securely attested on ostraca from the 18th Dynasty.¹⁴⁶ Still we are unable to adequately date the tombs on the basis of their marks exclusively. Some of the burials that contain a relatively large set of marks are perhaps better interpretable. The three different marks (⊕, Ψ and ⊕) in DM 1099 are all attested in group B, and ⊕ in particular is indicative of the ostraca in this group. The pottery assemblage could therefore date to the reign of Amenhotep II. The marks attested in tombs DM 1153-1155 (⊕, ⊖, ⊖, ⊖ and ⊕) are suggestive of the ostraca from groups D and C. The objects could therefore have been marks by individuals who were active in the reign of Amenhotep III, and perhaps Thutmose IV. The set of marks from tomb DM 1169 (⊕, ⊕, ⊕, ⊕, ⊕, ⊕ and ⊕) seem to point to a date around the same period.

2.6 CONCLUSIONS

2.6.1 The meaning and purpose of the 18th Dynasty ostraca with marks

Unfortunately, the exact meaning of the other ostraca remains a mystery. It is clear that the majority of ostraca is of an administrative character because the marks are accompanied by tally strokes or dots. The use of recurring sequences of marks leads to the same conclusion. Numerous ostraca appear to belong to the collective tomb administration, and may record absence or presence of individual workmen, the output of the labour of individual workmen, and perhaps the distribution of rations or the consumption of certain commodities. There are no clear indications that the ostraca were produced as part of private bookkeeping, recording transactions or inventories, but that possibility cannot be excluded either.

¹⁴⁴ Bruyère's publication is unclear regarding this mark, found on an amphora with the cartouches of Hatshepsut and Thutmose III. The same mark may have been attested on a similar mark, but the passage in Bruyère's report could also be dealing with the same vessel, see Bruyère, *Rapport 1934-1935* II, 93 and 194.

¹⁴⁵ See Bruyère's notebooks for the last two marks:

http://www.ifao.egnet.net/bases/archives/bruyere/?id=MS_2004_0155_003.

¹⁴⁶ Compare preliminary observations in Soliman, 'Workmen's Marks in Pre-Amarna Tombs' (forthcoming), § 3.3.

Despite the highly enigmatic nature of the ostraca from the 18th Dynasty, close examination leads to some interesting insights into the organisation of the workforce. First of all, there are three possible instances of an ostrakon that is slightly more explicit about its content. As we have discussed above, O. Cairo JE 96285 might contain a reference to wine. The workmen connected with it could then have been involved in its transport, production, or distribution. On ostraca ONL 6371 and O. UC 45683 a triangular shape is depicted, which is slightly bigger than the marks are. The triangle might represent a chiselling tool, mentioned in Ramesside hieratic tomb records but certainly employed during the 18th Dynasty as well. During the 19th and 20th Dynasties chiselling tools, made from costly metal, were very valuable and therefore the property of the higher authorities. The tools were distributed among the workmen by the tomb administration.¹⁴⁷ The depicted triangle could be the tool called *ḥz* in such documents: a heavy spike without a handle made of copper or bronze. Such spikes were used to break stone by placing the pointed end on the rock and hitting the broad end with a wooden mallet.¹⁴⁸ The two ostraca that depict this presumed spike could be notes about the distribution of such tools among a group of workmen.

A clearly distinguishable category of marked objects are the limestone fragments inscribed with a single mark. They were not necessarily used for administrative practices. Instead they may have served as ex-votos, or they were used to mark the property or living space of an individual.

If the majority of the 18th Dynasty ostraca are administrative in nature, what would have been their function? It has been established in the previous chapter that we possess virtually no hieratic documentary texts written on ostraca. The 18th Dynasty ostraca with marks do not attest to any influence of hieratic script either. In general, there is very little textual material that dates from this period. While there are 2000 graffiti in the Theban valleys that date to the 19th and 20th Dynasties, not a single textual graffito can be securely attributed to 18th Dynasty.¹⁴⁹ In addition there is remarkably little inscribed material from funerary contexts. The few inscriptions that have survived in tombs of the middle of the 18th Dynasty are prone to numerous scribal errors. For instance, the common *ḥtp-dī-n(y)-sw.t* formulae on the coffins from the Eastern Cemetery contain mistakes in the orientation and position of signs, whereas some words and sign groups are erroneously omitted while others are present where they should not be.¹⁵⁰ In the same vein, the texts in the tomb of Amenemhat (TT 340), a grave that dates to the beginning of the 18th Dynasty, are teeming with scribal mistakes. The artist of the tomb certainly had some knowledge of script, and evidently he possessed the skills to draw them. Yet, his texts contain many errors. The artists would seem to have had a

¹⁴⁷ Jac. J. Janssen, *Commodity Prices from the Ramessid Period. An Economic Study of the Village of Necropolis Workmen at Thebes* (Leiden 1975), 312.

¹⁴⁸ Janssen, *Commodity Prices*, 313; for examples from the 18th Dynasty found in the tomb of Kha, see Schiaparelli, *La tomba*, 83, fig. 50; see O. Fitzwilliam EGA 4324.1943 (obverse) for a drawing of a workman holding a chiselling tool and mallet in Emma Brunner-Traut, *Egyptian Artists' Sketches. Figured Ostraka from the Gayer-Anderson Collection in the Fitzwilliam Museum, Cambridge*. PIHANS 45 (Leiden 1979), pl. XII, 14.

¹⁴⁹ The only hieratic graffito that might be dated to the 18th Dynasty is Theban Graffito nr. 1670, which mentions a scribe named Kha. There is a possibility that this Kha is the 18th Dynasty Overseer of Work who was buried in TT 8, but that is far from certain, see Alexander J. Peden, *The Graffiti of Pharaonic Egypt. Scope and Roles of Informal Writings (c. 3100-332 B.C.)*. PdÄ 17 (Leiden, Boston and Cologne 2011), 141, n. 43; 243, n. 742; Russo, *Kha (TT 8)*, 57. A number of graffiti from sections D and E of the Valley of the Kings comprise or include names of members of the royal family of the 18th Dynasty but are not necessarily contemporaneous, see Peden, *Graffiti*, 144-145. Reportedly a small number of inscriptions in royal tombs of the 18th Dynasty are contemporaneous with the construction of these tombs, see Peden, *Graffiti*, 141-144.

¹⁵⁰ Soliman, 'Workmen's Marks in Pre-Amarna Tombs' (forthcoming) [12-13]. For the coffins, see Bruyère, *Rapport 1934-1935* II, 41; Andreu (ed.), *Les artistes*, fig. 32; Miroslav Verner, *Altägyptische Särge in den Museen und Sammlungen der Tschechoslowakei*. Lieferung 1. CAA (Prague 1982), Náprstkovo Muzem 1/322-1/334.

preference for the use of uniliteral signs, and many of his words were improvised phonetically rather than correctly spelled.¹⁵¹ The evidence thus indicates that necropolis workmen of the 18th Dynasty were not particularly well acquainted with hieratic script, and that most of the men were probably not able to produce hieroglyphic texts without making errors.

Their apparent lack of scribal skills suggests most workmen were not trained to write texts in hieratic or in hieroglyphic, but it is exceedingly clear that this did not prevent them from writing texts, incorrect as they may have been. In this group of 18th Dynasty necropolis workmen we are witness to quite a strong affinity with the hieroglyphic script, and occasionally the drive to produce textual material. The practice of using series of identity marks to create records on ostraca seems appropriate in this environment, because these marks are no examples of scribal practice in the strict sense either. The method, however, closely approaches the use of script, and as such the ostraca with marks are a parallel for the erroneous hieroglyphic inscriptions from Deir el-Medina: one needs scribal tools to create the marks, the marks have the appearance of script, several marks are even borrowed from script, they function in some way just like script, but just like the incorrectly written hieroglyphic texts, they are part of a non-standardised practise.

The existence of a marking system at Deir el-Medina should not surprise us. Several other 18th Dynasty crews of workmen active at various sites appear to have employed identity marks as well.¹⁵² It is harder to determine what inspired the attraction of the men in this particular workmen's community to the hieroglyphic script. The presence of professional and skilful draughtsmen must have contributed to this phenomenon, and we have concluded that some draughtsmen must indeed have been responsible for a small percentage of the ostraca with marks. We can only speculate about other influential factors. Certainly, the workmen's exposure to hieroglyphs and scribal culture must have been greater than that of the average quarryman. The Deir el-Medina crew must have been in contact with important scribes from Thebes, and apart from the fact that they laboured inside tombs decorated with hieroglyphs, there is a possibility that the workmen were actively involved in the royal burial itself. That can be surmised from the identity marks that were found in the embalmers cache of KV 63. Whatever the precise role of the workmen in the burial of the king might have been – carrying the kings' funerary equipment into the tomb; witnessing funerary rituals; participating in the sealing of the tomb – it is conceivable that they came into contact with hieroglyphs in that capacity as well.

Still, there is quite a difference between making use of a marking system to mark one's property on the one hand, and to record series of marks on ostraca on the other. How can we explain the purpose of the ostraca with marks? It seems absolutely unlikely that anyone outside of the community of necropolis workmen would have understood these strange documents, and they were evidently not submitted to the high authorities in Thebes. Although the ostraca with marks were not produced on a daily basis, one could still make a case for the *majority* of the 18th Dynasty ostraca with marks as essentially representing the administrative records of the necropolis workmen in the same way as the hieratic ostraca represent the administration of the Ramesside crew. As an argument for this hypothesis one could raise the point that no administrative scribe seems to have been permanently present with the crew of workmen during the 18th Dynasty.¹⁵³ Yet it would appear extremely odd that administration of such a grand and eminent construction project would have been left in the hands of a group of workmen, most of whom were probably to a great extent illiterate.

¹⁵¹ Soliman, 'Workmen's Marks in Pre-Amarna Tombs' (forthcoming) [5]; see the contribution of Jean-Marie Kruchten in Cherpion, *Deux tombes*, 41-55.

¹⁵² See chapter 1, 1.2.

¹⁵³ See chapter 1, p. 31-32; p. 40; p. 66-67.

Moreover, scribes are certainly attested in Deir el-Medina during the 18th Dynasty,¹⁵⁴ and there are strong indications that they were occasionally present at the worksite in the valleys as well. This follows from the fragment of a hieratic documentary papyrus dating to the middle of the 18th Dynasty that was discovered in the Valley of the Queens, but also from a hieratic date line in WV 22, the tomb of Amenhotep III.¹⁵⁵ We may thus advance the hypothesis that work at the royal tomb was monitored and administrated by one or more professional scribes. In contrast to the other contemporary construction sites, this scribe was probably not permanently present with the workmen, and he does not seem to have been an inhabitant of Deir el-Medina. We suppose that the work on the royal tomb was deemed so important that a more notable scribe from Thebes was sent to occasionally check on the progress of the preparation of the tomb. Apparently this scribe has left no traces of his documentation at the Valley of the Kings, with the exception of a single snippet. We may therefore assume that he recorded his texts directly onto a sheet of papyrus, which he took with him to his offices in Thebes. During such audits, the scribe will have demanded a report on the advancement of the work from the Overseer of Work in the Great Place, and he may have also informed about the crew's necessity for supplies, tools, and certain commodities. This transmission of information between the scribe and the directors of the crew will most likely have been an oral exchange. Yet it is conceivable that at such moments the foreman or any other member of the workforce may have relied in part on the ostraca with marks. These documents could have been created as *aide-mémoires* of the matters that concerned the supply to the workforce and/or the progress of the work.

2.6.2 Administrative practices

The pluriformity of the layout of ostraca with marks suggests that they were not created according to a particular system. There is no evidence of a standardised format, and the authors of the ostraca seem to have devised different manners of recording information with marks as they went along. In other words, the practice of inscribing ostraca with marks during the 18th Dynasty was systemic, but the methods to do so were clearly not. This observation agrees with what had been assumed in the previous chapter on the basis of the variability in the titles of the 18th Dynasty: the organisation of work during this period does not appear to have been standardised to a great extent.¹⁵⁶

In several ostraca¹⁵⁷ traces of the deliberate erasure of marks and of dots and strokes are visible. Some instances may be corrections,¹⁵⁸ which indicate that the ostraca were checked after they were completed. Evidence for the revision of documents can also be found in ostraca in which each mark is accompanied by a small dot. These dots could be check marks left by a scribe who went over his own work or that of someone else. Minor as these features may be, they do give the impression that whatever it was that the ostraca with marks record, their subject was not some frivolous matter and an effort was made to guarantee that the documents were accurate.

¹⁵⁴ See chapter 1, 1.4.1.

¹⁵⁵ Peden, *Graffiti*, 142; Yoshimura (ed.), *Research in the Western Valley II*, 106, fig. 63; 178; for the location of the graffito see *ibidem*, 102, fig. 57; extremely brief hieratic inscriptions are in fact attested on stone blocks that closed off access to the cache of royal mummies in the tomb of Amenhotep II (KV 35), but these have been attributed to the end of the 20th Dynasty, see Charles C. van Siclen, III, 'Appendix II' in: Romer, 'Tuthmosis I and the Bibân el-Molûk', 129-133.

¹⁵⁶ See chapter 1, 1.4.3.

¹⁵⁷ E.g. O. Ashmolean HO 892; O. Cairo CG 24105; O. Cairo CG 24106; O. Cairo CG 24108; O. MMA 09.184.700; ONL 6692; and O. WV 10.

¹⁵⁸ E.g. the erased mark on O. MMA 09.184.700.

Most instances of erasure however are evidence of reuse of the ostraca.¹⁵⁹ Ostraca like O. Cairo CG 24106, O. Cairo CG 24108, O. Stockholm MM 14130 and O. WV 10 are lists of workmen to which dots and strokes were added, which were at some other point erased by a scribe so that he could use the list at another time. It can be surmised that OL 6788 served a similar purpose. The dots that accompany the marks on this ostrakon were added in a much lighter shade of red ink than the marks themselves, in all probability so that the scribe could easily remove them when he needed the ostrakon for a second administrative round.

2.6.3 The transference of identity marks

It has been explained in the previous chapter that the marks employed by the necropolis workmen are identity marks, and that each workman possessed his own personal mark. Yet, on the first ostrakon with marks that we have examined, O. Cairo JE 72490, two marks occur twice. We wonder what the meaning of the repeated marks is. If there existed several workmen with the same identity mark one would assume this would defeat the purpose of using identity marks altogether. O. Cairo JE 72490 demonstrates nicely that double marks can be situated next to each other, as are □ and □, but that is not the case for all examples of this phenomenon, and marks ○ and ○ on O. Cairo JE 72490 are not positioned close to each other. Other instances of twin marks that are not situated next to each are found on O. Cairo CG 24106 (𐎢 and 𐎣) and O. Cairo JE 96590 (𐎢). Still, double marks are most frequently written in adjacent positions, like the twin marks ⋆ in the upper line and twin marks 𐎢 in the third line of OL 6788. The couple formed by 𐎢 and 𐎢 is attested on several other ostraca. They are also inscribed next to each other on O. Stockholm MM 14130, ONL 6298, O. WV 3, and almost next to each other on O. WV 1. Twin marks are furthermore found side by side on O. Ashmolean HO 892 (𐎢), ONL 6465 (⊙), O. WV 4 (𐎢), and perhaps ONL 6371 (𐎢).

The double marks 𐎢 and 𐎢 on ostraca that are inscribed in accordance with a sequence, such as OL 6788, are quite informative about the meaning of the twin marks. They demonstrate that, at least in the case of 𐎢, the repetition is purposeful. Their pairing is no coincidence because several lists record them in exactly the same positions. Both marks have their own dots added to them, indicating they represent two different individuals who held adjacent positions in the fixed list of workmen. The twin marks are not only found next to each other in the fixed sequence, but also on other ostraca. The individuals would thus seem to be closely related. Perhaps a family connection existed between the two men represented by the same mark. There is abundant evidence of workmen from the Ramesside Period who transferred their identity mark to their sons.¹⁶⁰ We may be witnessing the same practice on 18th Dynasty ostraca with twin marks: they could represent a father and his son or a senior workman and his apprentice, who operated as a duo on a regular basis and were therefore noted down together on ostraca with marks. Indeed, there is evidence of fathers and sons who were both active as necropolis workmen during the 18th Dynasty.¹⁶¹ The interpretation of twin marks as a father and a son would also explain the name stones with a double mark.¹⁶² If the marks on these ostraca would truly refer to two family members or two close colleagues, these could have been placed in a living space that was shared by the two, or near objects that were in their possession.

¹⁵⁹ Compare the discussion of O. Cairo CG 24106 above, p. 150-151.

¹⁶⁰ Haring, 'Decoding the necropolis workmen's funny signs', 51; Aston, 'Theban potmarks', 55; Mark Collier, 'rating Hieratic and Marks Data for the Prosopography of Deir el-Medina Workmen in the early to mid 20th Dynasty' in: Haring *et al.* (eds.), *Decoding Signs of Identity* (forthcoming) [16-17 and *passim*]; chapter 6, 6.5.4. Close working relations between fathers and their sons are demonstrated during the 20th Dynasty, when fathers and one or two of their sons shared a hut in the Valley of the Kings, see Dorn, *Arbeiterhütten*, 71-72.

¹⁶¹ Examples have already been mentioned in the previous chapter: Kha and his son Amenemope; Minhotep and his son Nakhtmin; perhaps also Amenemope and his son Tener; Amenhotep and his son Wadjetshemes.

¹⁶² ONL 6345 (𐎢); ONL 6403 (𐎢); ONL 6363 (𐎢).

2.6.4 The organisation of the workforce

On the basis of our assessment of data from the 18th Dynasty in the previous chapter we had pointed out that there is no evidence for a division of the workforce into two halves, as in the Ramesside Period.¹⁶³ No such division is reflected in the ostraca with marks from the 18th Dynasty either. Ostraca such as OL 6788 and ONL 6298, firmly situated in group C, record around 40 marks each, and this seems to be the entire workforce at a certain point. That is suggested by the ostraca from the area of the tomb of Amenhotep III, the ostraca that constitute core group C. As an assemblage, these 12 ostraca contain 49 different marks. The 40 odd marks on OL 6788 thus cannot represent only one half of the crew, but must be the number of (almost) all active workmen at that time. Certainly there are completely preserved ostraca that record around 20 marks, and they could represent one half of the crew. On the other hands there are numerous other intact ostraca that include higher or smaller numbers, and it can therefore not be assumed that ostraca which record about 50% of the workmen active during a certain period is proof of a division of the crew into two sides.¹⁶⁴

2.6.5 Hierarchy within the workforce

In a number of ostraca we recognise mark ,¹⁶⁵ the identity mark of Kha, overseer of the work on the royal tomb. His mark could be identified thanks to the objects in his tomb (TT 8).¹⁶⁶ Other marks have been attested in the tomb of Kha as well, and they lead to an interesting hypothesis. The following argumentation is based solely on the marks that have been published, and it is not clear if more marks feature on other objects from the tomb of Kha. Still, the available marks attested in the tomb are all found on the ostraca from group C:  (attested twice), , , ,  and . Strangely enough the latter mark is not found on any of the 18th Dynasty ostraca.¹⁶⁷ The other five marks are all present in the sequence recorded on OL 6788: mark  is found in position 43, mark  in position 32, mark  in position 24, mark  in position 3 and  (inscribed twice) in positions 1 and 2. The latter two marks are thus positioned at the beginning of the sequence, and this is perhaps not entirely coincidental. We have seen that , the mark of Kha, is not recorded on OL 6788. It is found on O. Cairo JE 72490, attributed to the reign of Thutmose III, and on ONL 6298, which is clearly related to group C. On the latter ostrakon, the mark of Kha appears at the beginning of the sequence, probably in the capacity of the foreman of the crew in analogy with ordered name lists from the Ramesside Period. In documents of this period, the captains of the crew always head the list.¹⁶⁸ Because the mark of Kha is absent on OL 6788 this ostrakon could be later than ONL 6298, dating to a time when Kha had retired from his position as foreman. Comparing the first 16 marks in the sequence of OL 6788 to that of ONL 6298 (TABLE 18), we find supporting evidence for that hypothesis: mark  is situated in the seventh slot of the sequence of ONL 6298, but on OL 6788 it has moved upward in the sequence to fill in the position that became available when Kha laid down his office. The workman with mark  may thus have been Kha's successor as foreman of the crew.

¹⁶³ See chapter 1, 66.

¹⁶⁴ Nuancing preliminary observations in Soliman, '18th Dynasty Marks Ostraca', 165.

¹⁶⁵ O. Cairo JE 72490; ONL 6298; ONL 6330; ONL 6369; and ONL 6424; ONL 6330 and ONL 6369, both discovered at Deir el-Medina, appear to be name stones, here interpreted as objects that may be placed in a particular space to represent its owner or inhabitant. If this assumption is followed, it would seem likely that Kha had lived at the village after all; compare earlier doubts about this question in Haring, 'Scribes and Scribal Activity', 109; Haring, 'Workmen's Marks and the Early History of the Theban Necropolis', 89.

¹⁶⁶ See chapter 1, p. 42-43.

¹⁶⁷ It does appear twice on pottery vessels discovered near KV 63, see Schaden, 'The Amenmesse Project 2006', 231-254, fig. 23, nrs. 7 and 14.

¹⁶⁸ See chapter 4, 4.1, and *passim*.

2. OSTRACA WITH MARKS OF THE 18TH DYNASTY

OL 6788															
✧	✧	⊞	⊞	⊞	⊞	⊞	⊞	⊞	⊞	⊞	⊞	⊞	⊞	⊞	⊞
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ONL 6298															
⊞	⊞	⊞	⊞	⊞	⊞	✧		⊞	⊞	⊞	⊞	⊞			⊞
	4	3	5	6	7	1		12	29	14	15	13			16

TABLE 18. BEGINNING OF THE SEQUENCES ON OL 6788 AND ONL 6298

These observations are important for two reasons. Firstly, it could explain why mark ✧ is attested twice in the tomb of Kha. The two objects with this mark, one of which was a valuable bronze bowl,¹⁶⁹ would appear to be funerary gifts offered by a close colleague and inheritor of Kha's position, and therefore a man of quite some social standing. Secondly, the upward movement of mark ✧ in the sequence of workmen, as recorded on ONL 6298 and OL 6788, indicates that these ostraca are truly ordered and to some extent hierarchical lists. The position of a mark within this list seems to be related to the workman's rank. This ensues from the assumption that when the workman with mark ✧ was promoted, his position in the sequence moved upwards. If mark ✧ in slot 1 on OL 6788 belongs indeed to the foreman of the crew, we may speculate that its twin mark in slot 2 represented a son of the foreman, who perhaps carried out the duties of the deputy of the crew in analogy with the Ramesside administrative model.

Because OL 6788 is an ordered list, mark ⊞ too must have referred to a man of a high social status, because his mark is positioned very close to the head of the list in position 3. His high rank might have made him a close colleague of Kha as well, and therefore he too may have wanted to donate a small gift to the funeral of Kha. Of course none of this proves that the individuals who gifted objects to the funerary equipment of Kha were exclusively workmen of a high social standing. Neither does it follow that high-ranking, senior workmen were listed *only* at the beginning of the list. Still, there are indications that the majority of younger workmen are listed in the second half of the sequence. We may propose that those workmen's marks that occur just in group C and are not attested in groups A, B and D belong to workmen who were new to the crew at the time of the group C ostraca. Our data suggests they joined the crew somewhere in the reign of Amenhotep III and were not active long before that time. The identity marks of these new recruits are all found in the second half of the sequence of OL 6788, with the sole exception of mark ✧ (position 9):

Position in OL 6788									
✧	⊞	⊞	⊞	⊞	⊞	⊞	⊞	⊞	⊞
9	20	22	27	29	33	34	40	41	43

We can therefore state that in all probability the sequences of marks attested on ostraca such as OL 6788, O. Stockholm MM 14130, ONL 6298, and O. WV 3 are all ordered lists. This particular type of document occurs also in the hieratic administration of the Royal Necropolis during the Ramesside Period, and it will be shown in the next three chapters that such lists were made with workmen's marks as well.¹⁷⁰ Ordered lists of workmen record one half or, as is the case in the 18th Dynasty, the entire workforce. Generally, the captains of the work and the most prominent workmen are listed at the beginning of the list, while younger workmen appear further down. Ordered lists played an important role in the collective administration of the work on the tomb and must have been used to keep track of absenteeism, but more

¹⁶⁹ Turin S. 8218 RCGE 19799, see Schiaparelli, *La tomba*, fig. 118, 4.

¹⁷⁰ For an introduction to such lists see chapter 4, 4.1.

importantly to document the rations distributed to the individual members of the crew.¹⁷¹ The assumption that several ostraca with marks record hierarchical ordered lists agrees with the ascertainment that the 18th Dynasty workforce was not a homogenous group of workmen, but included foreman and several specialists.¹⁷²

2.6.6 The size of the workforce

Complete and nearly complete ostraca with lists of workmen of the entire crew, such as OL 6788 and ONL 6298 demonstrate that during the reign of Amenhotep III the workforce consisted of about 44 workmen, including a foreman.¹⁷³ It would seem that in earlier times the crew was smaller, but that statement is based solely on the surviving archaeological material. It is true that the total number of different marks that is attested in groups A, B and C is smaller than 40, and it is also a fact that we do not possess any ostraca from a time before the reign of Amenhotep III inscribed with a total number of marks that comes close to the figure 40. But, as so very often, we are unable to ascertain if this is a reflection of the actual size of the workforce or whether this view is the result of a bias in the archaeological record. We have to be aware of the possibility that the Amenhotep III material is better preserved because A) it is less old than for example the Thutmose III material, and B) the securely dated ostraca from the time of Amenhotep III were found at the remote site of his tomb in the West Valley, which has seen fewer disturbances than the sites of the tomb of earlier kings.

Fortunately we can somewhat qualify the latter statement when we shift our focus to the village of Deir el-Medina. Here too we may assume that the oldest material has the smallest chance of surviving the test of time, but material from the reign of Amenhotep III is not necessarily better preserved than that of other periods. Yet, ONL 6298, the long list of workmen attributed to group C, was discovered in the village and attests to about 40 workmen. Significantly, no other ostrakon from the village that dates from before the reign of Amenhotep III records an equally large number of workmen.

We will therefore cautiously take the surviving ostraca available to us at face value. Examining the ostraca in the four core groups we detect an increase in the number of workmen's marks over time:

Group A:	Thutmose III	24 different marks
Group B:	Amenhotep II	37 different marks
Group D:	Amenhotep II – Amenhotep III	29 different marks
Group C:	Amenhotep III	49 different marks

These figures would suggest a slight decline in the number of workmen at the time of group D, but as explained above this group is less well defined. The perceived growth in the number of workmen is paralleled by the total number of workmen – not the total number of different marks – recorded on some of the completely preserved ostraca. Such complete ostraca are of course only evidence of the minimum of workmen that was active at a certain point, but the total number of different marks attested in each core group suggests that some documents do indeed record the full crew.

Take for example O. Cairo JE 72490, a completely preserved ostrakon in group A that is inscribed with 22 marks. This figure is close to the total of 24 different marks attested in group A as a whole. Hence the ostrakon could well be a list of the workforce in its entirety.

¹⁷¹ We will discuss the use and the purpose of name lists in more detail in chapters 3, 4 and 5; see also Koen Donker van Heel, 'Did the Deir el-Medina scribes use drafts' in: Donker van Heel and Haring, *Writing in a Workmen's Village*, 18-27.

¹⁷² See chapter 1, 1.4.1.

¹⁷³ Cf. Haring, 'Workmen's Marks and the Early History of the Theban Necropolis', 95.

All necessary reservations aside, the available data suggest that the workforce of the time of Amenhotep III (ca. 44 workmen) had doubled in size compared to the crew of the time of Thutmose III (ca. 22 workmen).

The strength of the workforce from the time of Amenhotep II holds somewhere between these two figures. While 37 different marks are attested in group B, completely preserved ostraca point to a group of 26 (O. Cairo CG 24105; O. Cairo CG 24107) to 30 workmen (O. Cairo CG 24106). The damaged ostrakon O. KV 10004 (24 marks are preserved) supports this estimate. Whether the size of the crew was truly brought back to around 22 workmen during the time of group D is open to debate. The total number of 29 different marks attested in this less well defined group is larger than that of group A but smaller than that of group B. Indeed, ostraca such as O. Cairo JE 96631 (group D; 21 workmen), O. Cairo JE 96590 (attributed to group D; 19 workmen), and O. Cairo JE 96603 (attributed to group D; 22 workmen), all apparently preserved in their entirety, are suggestive of a crew that was of about the same size as that during the time of Thutmose III.

2.6.7 The workmen

The scarcity of epigraphic material from the 18th Dynasty that mentions workmen by their names prevents us from connecting the majority of the marks with a particular individual. In fact, the only securely identified person is the overseer of work Kha, designated by mark . On account of the occurrence of mark  on ONL 6520 we have very tentatively proposed to connect this mark as well as mark  with a workman named Maaninakhtuef, although no man of that name is attested in the 18th Dynasty. Two other careful identifications can be proposed based on finds from the Western Cemetery of Deir el-Medina. In tomb DM 1350 a ceramic jar was discovered that is inscribed with the name of a Heqanakht. On the body of the vessel an allomorph of mark  was incised.¹⁷⁴ Heqanakht is not known from other sources but it is plausible that he was the workman to which mark  refers. Another tomb from the 18th Dynasty, DM 1099, was attributed to a man named Nekhunefer. Six ceramic vessel fragments incised with workmen's marks were discovered in the tomb, of which mark  occurred most frequently (three instances). There may therefore be a possibility that this mark referred at some point to this Nekhunefer.

Tentatively identified marks

TT 8	Kha		attested in groups A and C
DM 1350	Heqanakht		attested in groups D and C
DM 1099	Nekhunefer		attested in groups B, D and C
-	A Maaninakhtuef ?		attested in group B and later?

¹⁷⁴ Bruyère, *Rapport 1933-1934 I*, 112, fig. 48, nr. 7; 121.